BBC • MASTER • ELECTRON • ARCHIMEDES JULY 1989 £1·50

BBC ACORN USER

DESERT ISLAND DISC:
Sailing away to classroom adventure

FINEST FAX:
Personal organiser page designer

ADDING TO THE ARC:
Mastering the art of Arc interfacing

FULL PAGE BATTLE:
Wapping Editor vs Pixel Perfect

STAR TRICK

Colliding galaxies on-screen simulation

CINE

WHEN GALAXIES COLLIDE

SCREENPLAY BY ANDREW RANKIN





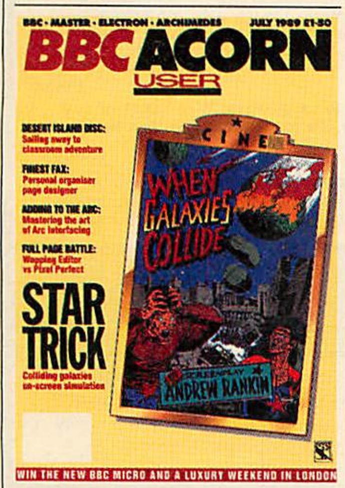
WIN THE NEW BBC MICRO AND A LUXURY WEEKEND IN LONDON

BBC ACORN USER

ISSUE NO 84

JULY 1989

COVER



COVER FEATURE

Colliding galaxies on the screen of your micro on page 58
Cover by Bob Murdoch



Editor Geoff Bains. **Assistant Editor** Pauline McLernon. **Technical Editor** Robert Miller. **Editorial Assistant** Christina Neal. **News** David Janda. **Production Assistant** Sally-Ann Sweeney. **Art Director** Ian Findlay. **Art Editor** Paul Holmes. **Art Assistant** Simon Rees, **Ad Manager** Roger Mullins. **Deputy Ad Manager** Perry Hodder. **Sales Executives** Richard Power, Duncan Pringle. **Ad Production** David Noakes. **Publishing Services Executive** Seran Anderson Haddick. **Group Editor** Tony Quinn. **Managing Editor** Ellen Brush. **Publisher** Seamus Geoghegan **Publishing Director** Michael Potter. **Editorial Director** Christopher Ward.

ABC

Published by Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. Tel: 01-490 1444. Telecom Gold 81: RED001. Micronet 919992492. Printed by Riverside Press, Gillingham. Typeset by Ician Group Ltd, Harlow. Colour by Trumps Studio, Ware, Herts. Print production by Aquarius Print and Design, London. Distributed by BBC Magazines, 35 Marylebone High Street, London W1. ISSN 0263 7456

see us at the BBC ACORN USER show '89

STAND Nos. 62, 63, 65

THE ADVANCED PLUS 3 MK II

NEW NEW

The only fully compatible disc upgrade running Acorn's own filing system. The MK II is now supplied with 3.5" DOUBLE SIDED disc drive providing a storage capacity of 640K. A.P.3 MK II gives you

1. A fully Acorn compatible 1770 interface (Cartridge)
2. 80 track 3.5" disc drive, double sided (640K)
3. Separate PSU
4. Acorn ADFS
5. Welcome disc
6. Utilities
7. Full documentation
8. All the advantages of the original Plus 3 PLUS extra ROM socket.



NEW IMPROVED

Undoubtedly the most popular disc upgrade system for the Electron (Requires Plus 1)

Remember — 2nd drives (3.5 or 5.25) can be added and the AP3 drive can be used on a BBC or Master computer! Also most Electron disc-based software is supplied on 3.5" ADFS discs.

The only fully compatible disc upgrade running Acorn's own preferred filing system (supplied on: Plus 3, Master 128, Master Compact and now the Archimedes)

*** EXTRA BONUS ***

3 games on disc — SNAPPER — DRAUGHTS — REVERSI

COMPLETE PACKAGE ONLY

£129 excl VAT : £148.35 incl VAT

ADVANCED PLUS 1. . .The plus 1 is the main expansion for the Electron. It provides the Centronics parallel printer, printer port, joystick interface and 2 cartridge slots into which go ROM cartridges including View, Viewsheet, Pascal, Logo and our own popular AP4 disc upgrade.

£50.00 excl VAT; £57.50 inc VAT

ADVANCED PLUS 6. . .a fully buffered 6 ROM expansion module for the Electron user. AP6 is fitted inside the Advanced Plus 1 or modified Acorn Plus 1 (when used with the Acorn Plus 3, 5 ROM sockets are available). All sockets are designed to accept either ROM/EPROMS or RAM chips. A further feature is the optional AP7 upgrade.

"A marvellous piece of design. . .don't hesitate buy it!" - *EU, May '88*

£33.00 excl VAT; £37.95 inc VAT

Upgrade service available for original Acorn Plus 1 please call for details

MUSIC 5000

The popular BBC music synthesizer available for Electron users. Required 1MHz buff (see AP5). Supplied as M5000 Synthesizer hardware, 16k ROM, disc utils, and full documentation.

£99 excl VAT; £113.85 inc VAT

Please state 3.5" ADFS/5.25" DFS

ADVANCED PLUS 5

A unique interface for those wanting the maximum expansion from just one slot in the PLUS 1 AP5 contains:- A User port for connecting peripherals such as a mouse. 1 MHz bus allowing Music 5000(e), prommers and various control devices to be added. Tube interface for connecting and Acorn 2nd processor or even a Master Turbo board (through a 'Co-Pto Adaptor') - & TWO spare ROM sockets (1 high priority). All hardware connections are Acorn compatible thereby allowing many BBC products to be added (remember that some software modification may be necessary for the Electron). So although some expansion options may appear expensive on an Electron you do have upward compatibility.

£55.00 Ex VAT; £66.70 inc VAT

Advanced Plus 2 ROM

We feel this is one of the best, low cost, additions we have produced for the Electron & +1 user, especially for Plus 3, AP3, ABR & AP7 users now with this easy to fit upgrade you can add:

1) Fix for Tape filling system in Hi-res screen modes. 2) * ROMS- displays ROM/ROM images present. 3) * UNPLUG disable ROM/RAM image. 4) * INSERT - enables or inserts a previously unplugged ROM. 5) * KILL - totally disables the Plus 1. 6) * LOCK - locks a sideways RAM bank in ABR, AQR, AP7 7) * LROMS - locks all sideways RAM banks found. 8) * UNLOCK - to unlock a sideways RAM bank in ABR, AQR, AP7 9) * UROMS - to unlock all sideways RAM banks found. 10) * SAVEROM - saves a ROM image to current filing system. 11) * LOADROM - loads a ROM image from current FS into a RAM bank. 12) * FORMAT - will format an ADFS disc for Plus 3 or AP3. 13) * VERIFY - tests every sector on an ADFS disc. 14) * VFORM - formats and verifies an ADFS disc in one command. 15) * BUILD - creates a text file that can be used by *EXEC (ie !BOOT). 16) * LIST - displays a numbered listing of a text file 17) * TYPE - displays a file on screen with no line numbers. 18) * DUMP - to view a file's contents on screen. 19) * LANG - selects a default language to be booted on (CTRL-BREAK) 20) * HELP - provides a full 'help' list on all the ROM's commands. 21) * AQRPAGE - selects specified page in AQR.

Now there is no need to search for your utilities disc every time you want to Format/Verify a disc, Build a !BOOT file or lock/unlock/Load a ROM image into ABR PLUS much more . . . . . the ideal companion from the company that produces the Acorn Plus 1.

£11.00 ex VAT; £12.65 inc VAT

The AP2 is the definitive Plus1 ROM. . . . .I'm not sure what i'd do without it. . . . .like all of PRES's other products, it's been well worth waiting for"

July '88

FILING SYSTEMS

ADFS VERSION 1.1

Suitable for existing Plus 3 or A.P.4 users. This new version has the software fixes for Zysyshelp, write protect disable & compaction. Also Winchester code has been replaced with the necessary driving software to handle AQR as a 256k RAM DISC. Please note - ADFS is Acorns adopted standard filing system supplied on the Plus 3, Master 128, Master Compact & now the Archimedes. Supplied on 16k ROM with Welcome disc & utilities. Please state 3.5/5.25 welcome disk.

£14.95 ex VAT; £17.19 inc VAT

(ADFS manual supplied separately)

ADFS EOO

For Electron users with either Plus 3 or A.P.4 and 32k of S/W RAM i.e. ABR. All the benefits of ADFS but without all the loss of RAM! Includes all the software 'fixes' call for managing the new & original ADFS. One of the most frequent question we are asked: "How do I get back the memory lost on my Plus 3 system?" Answer: PRES ADFS & EOO regains 3.75k leaving page @ &EOO the same as Tape!

ADFS EOO supplied; 3.5 ADFS (manual available separately)

£14.95 ex VAT; £17.95 inc VAT

5.25 ADFS (manual avail. sep.) **£14.00 ex VAT; £16.10 inc VAT**

5.25 DFS(2 discs+ADFS manual) **£19.00 ex VAT; £21.85 inc VAT**

(See Special Package Prices)

DISC INTERFACES (Plus One required)

AP3 INTERFACE: As supplied with AP3 package. A fully Acorn compatible disc interface that will accept any standard 5.25 or 3.5 80T drive with PSU. It runs Acorn's ADFS (as supplied on Acorn Plus Three, Master 128, Master Compact and now the Archimedes) supplied with A.D.F.S. manual and welcome disc + Utilities and 3 bonus games (please specify 3.5 or 5.25 80T format). Also provides a spare 16K rom socket. **Price £52.00 ex VAT £59.80 inc VAT**

AP4 INTERFACE: A fully Acorn compatible disc interface that will accept any standard 5.25 or 3.5 drive with PSU. It runs the 1770 DFS (as fitted in the BBC 'B' and Master) keeps pace at &EOO - has utilities in rom and provides a spare 16K rom socket (DFS manual included. **Price £60.83 ex VAT £69.95 inc VAT**

AP34 INTERFACE: Get the best of both filing systems. Now available from PRES the ultimate interface. Fitted with both Acorn approved filing systems. . .Acorn's current standard ADFS and Acorn 1770 DFS (which can be run at &EOO) ADFS and DFS manuals supplied + ADGFS welcome disc with utilities. **Price £69.55 ex VAT £79.98 inc VAT**

SOFTWARE PRODUCTS

ADVENTURE GAMES 5 different adventure discs:- Ultimate Prize, Dreamtime, Priate's Peril, Taroda Scheme & Stranded.

All 3.25 ADFS £6.95 ex VAT £7.99 inc VAT each disc

Advanced Games Compendiums - on disc with so many of our products providing more 'serious' add-ons for the Elk; we thought it was time to allow easy Access to some of the favourite games ON DISC! . . . Three volumes of popular games, previously only available on tape, now 'instantly' loadable from menu on disc. Titles such as Croaker, Felix & Fruit Monsters, Killer Gorilla, Danger UXB, Swoop, Ghouls, Invaders, Swag, Galactic Commander, Felix in the Factory, Bumble Bee, Gauntlet, Frenzy, Moonraider, Positron etc. etc.. Each volume contains EIGHT menu selectable games.

3 ½ ADFS £9.99 ex VAT £11.49 inc VAT

5 ¼ DFS. £8.99 ex VAT £10.34 inc VAT

View the Acornsoft word process for the Electron & +1 inc. full documentation £14.94 inc VAT

ViewSheet The Acornsoft. . . . . spreadsheet for the Electron & +1 inc. full documentation £14.95 inc VAT

View & ViewSheet special price . . . . £22.00 inc VAT

SPECIAL PACKAGE PRICES

AP1 + AP3	£139.00 ex VAT	£159.85 inc VAT
AP1 + AP6	£77.00 ex VAT	£88.55 inc VAT
ABR + 3.5" ADFS E00	£48.65 ex VAT	£55.95 inc VAT
ABR + 5.25" ADFS E00	£46.95 ex VAT	£53.99 inc VAT
ABR + 5.25" DFS (ADFS E00)	£51.00 ex VAT	£58.65 inc VAT
AP5 + Music 5000	£152.17 ex VAT	£175.00 inc VAT
AP7 + 3.5" ADFS E00	£49.52 ex VAT	£56.95 inc VAT
AP7 + 5.25" ADFS E00	£48.65 ex VAT	£55.95 inc VAT
AP7 + 5.25" DFS (ADFS E00)	£52.13 ex VAT	£59.95 inc VAT
AP4 + CS400	£147.78 ex VAT	£169.95 inc VAT
AP1 + AP4 + CS400	£189.00 ex VAT	£217.35 inc VAT

********** ACCESSORIES **********

	ex VAT	inc VAT
Electron power switch This useful accessory provides a double-pole in-line switch with a new power jack-plug already attached; just connect to the existing lead, having removed the old jack-plug.	£3.96	£4.55
Plus 3 2nd drive adaptor converts the fitting at the back of the original drive which has been configured to Drive 1.	£6.91	£7.95
AP3 2nd drive lead replaces existing drive cable with one containing an extra connector for adding a second drive configured as Drive 1.	£5.96	£6.85
Electron Advanced Users Guide		£3.95
ADFS Guide Manual		£5.00
DISCS 3.5 10 in plastic library box		£19.95
5.25 twin gift pack		£1.49

M = Master B = BBC C = Compact E = Electron

Please note our NEW address:-
P.R.E.S. LTD.,
P.O. Box 319,
Lightwater, Surrey GU18 5PW.
Tel: 0276 72046 (24 hr).
Fax: 0276 51427

(Mail order only)

All our prices include UK delivery & VAT.

VISA

(in event of any query— please include your tel. no.)

Product Qty @ Total

Name ....

Address ....

....

....

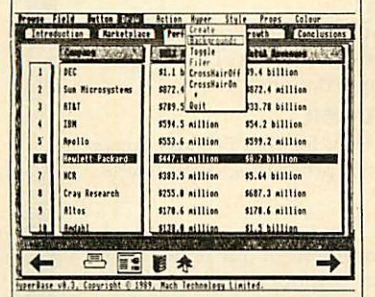
Postcode ....

Tel: .... I enclose payment for £ ....

Credit Card No.: .... Exp date .... (Ref A120)

NEWS

All out for the Arc



Newly formed Archimedes specialist Mach Technology plans to launch 20 new hardware and software products by the end of 1989. Formed by three academics earlier this year, the company has kept its plans quiet until now.

Products available right now include *Hyperbase*, a database system, for £50. It's similar in concept to the *Hypertext* system available for the Apple Macintosh.

Basic V and Modula-2 compilers at £40 and £90 respectively will produce native Risc code, and the company will not require royalties to be paid for commercial applications that might be developed.

On the hardware front, Mach is selling a range of six hard disc systems which include the disc and podule but no backplane. At £249 for a 20Mb model and £359 for 40Mb, prices are competitive.

A product which should attract a great deal of attention at the *BBC Acorn User* Show is Mach-285 – a hardware PC emulator based on the Intel 80286 processor. Currently under development, the system will either come with 640K or 1Mb of Ram, be fully compatible with the IBM PC, will support either EGA or VGA graphics and costs £300 + VAT.

Mach Technology is on (0787) 238125.

Prestel to merge with BT Gold?

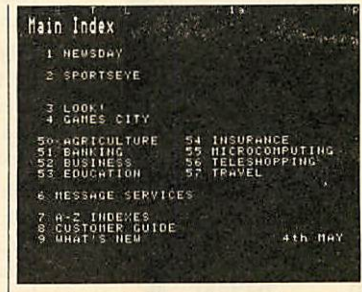
Dailcom Information Services has denied reports that the Prestel viewdata system is to close down.

Two stories in the February and March Issues of trade journal *Communications Management* claimed Dialcom had developed software which would enable Prestel to merge with Telecom Gold, the electronic mail system which is also operated by Dialcom.

The publication also said that Prestel would be wound down over a period of time.

A news story reporting the above appeared on Prestel's Clubspot 810 and rumours of its closure have been circulating among bulletin boards around the country

'There is absolutely no truth whatsoever in the rumours that Prestel is to be closed down', said John Tomany, Dialcom Head of Consumer



services, 'There is no foundation to the reports.' Commenting on the merger of the two databases he said 'There's no point. Both are aimed at different types of user.'

The offices of Telecom Gold Prestel were recently moved to Dailcom's new headquarters in Apsley, near Hemel Hemstead.

Tomany believes that the move, together with a policy of closer co-operation between both services may have resulted in some confusion within the communications industry, which has subsequently resulted in the stories of Prestel's closure.

However, *BAU* has received information that Dialcom commissioned a feasability study to look into the technical problems in merging Prestel with Telecom Gold. The subsequent report stated such a task is indeed possible. This gives backing to the stories which appeared in *Communications Management.*

Although Telecom Gold is mainly used for electronic mail and Prestel for information retrieval, the services they provide and the type of user at which they are aimed overlap. Both systems have links to databases that cater for the business user.

InterBusiness, a Micronet product on Prestel will shortly appear on Telecom Gold as did Shades, Micronet's multiuser adventure game.

July wait for Risc OS

Arc owners who ordered Risc OS in April may have to wait until mid-July before their order is met.

Acorn started delivery on schedule, on April 3 but by May some dealers had not received their full orders while others had received none.

Peartree Dram said, 'We've been waiting six weeks for an order of 100.' Data Store took delivery of 50 Risc OS upgrades from an order of 100. 'We thought Acorn would get their act together this time', said a spokesman who compared the situation with the problems dealers had in obtaining sufficient supplies of Mos 1.2 in 1982.

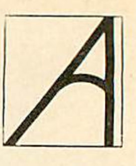
Jay Mehta of Technomatic had only received 15-20 per cent of his original order but he thought 'it's not worth complaining.'

It would appear that delivery problems for some dealers are not as bad for others. Nazir Jessa of Watford Electronics said 'we had problems in April, but all is OK now.'

Commenting on the delivery problems Acorn's Product Manager David Bell said, 'these are due to the lead time in getting Roms out of Japan, however I expect the backlog to be cleared by July.'

Many dealers suggested that distributors may be fitting existing stock with the new OS and only passing on the remainder to dealers. Bell acknowledges this but said he thought only be a small proportion would be effected. Acorn is on (0223) 245 200.

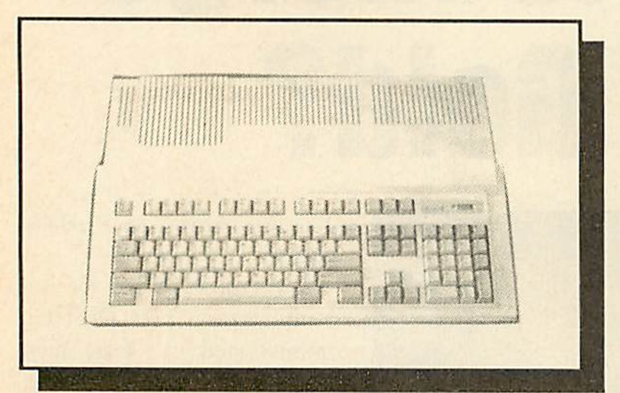




BEEBUG the Leading Archimedes Specialists

BEEBUG

Acorn's NEW A3000 Computer



ACORN A3000 SERIES		
0255G	A3000 Entry System	649.00
0256G	A3000 Colour System	869.00
ARCHIMEDES 300 SERIES		
0193G	310 Entry System	899.00
0195G	310 Colour System	1119.00
0257G	310M Entry System	959.00
0259G	310M Colour System	1179.00
ARCHIMEDES 400 SERIES		
0260G	410/1 Entry System	1199.00
0261G	410/1 Colour System	1419.00
0262G	420/1 Entry System	1699.00
0264G	420/1 Colour System	1919.00
0275G	440/1 Entry System	2499.00
0276G	440/1 Colour System	2719.00
0263G	440 Entry System	1929.00
0265G	440 Colour System	2149.00

PRICES EXCLUDE V.A.T.

BEEBUG offers you:

Technical Support Department
We don't lose interest as soon as you've made your purchase. You can always telephone our Technical Support Department or Showroom for some friendly and impartial advice.

Archimedes Magazine - RISC USER
Subscription is just £14.50 a year (UK), for this 56 page magazine packed full of useful information, programs, news, hints and tips etc.

Repairs and Service
If things do go wrong, you can be confident of our repair and service department. We will get your computer repaired as soon as possible, and return it to you free of charge, for a full year from the date of purchase.

Price
Our prices are competitive, but if you see a better current deal from another Acorn dealer, we will be pleased to match it. In that way you can be sure of the best price as well as outstanding support and service.

Speedy Service
We have a showroom in St Albans where you can see and try any of the systems. They are always on display and in stock. Our mail order service is also very efficient, with over 80% of orders going out the same day. 48 hour delivery charges on a complete system are just £7 and 24 hour delivery £11.50.

Payment and Finance
We accept cheques, Connect, Access and Visa, and are able to offer various credit options including 0% finance over 9 months or 13.75% flat rate (typical APR 28%) over 12, 24 or 36 months.

Archimedes Price Guarantee

We will match any current price or offer available from any other reputable Official Acorn Dealer.

MEMBERS SPECIAL OFFER - WHEN BUYING AN ARCHIMEDES SYSTEM WE WILL GIVE YOU ABSOLUTELY FREE:
PC Emulator, Printer Lead, Ten 3.5" discs & Lockable disc box. In addition with 410s you will receive 1st Word Plus and with 420s & 440s, the Software Developer's Toolbox.

OR

A choice of goods up to 10 % of the value of your Archimedes.

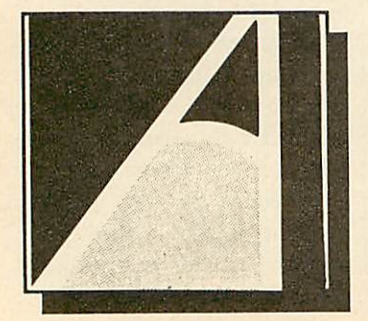
Please enquire for details of member's offers with 0% finance.

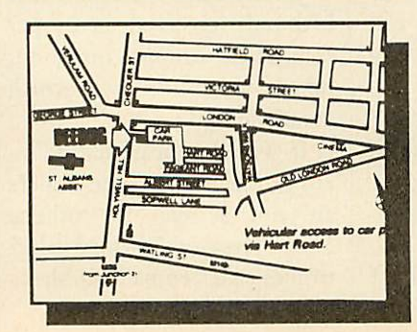
FURTHER DETAILS

Please telephone for more information on:

- 0% Finance over 9 months
- 12/24/36 Month Finance
- Trade-ins for Archimedes

Finance arranged within 48 hours and all orders for Archimedes despatched within 24 hours.





BEEBUG Ltd
Dolphin Place, Holywell Hill, St. Albans, Herts., AL1 1EX
Opposite Clarks Camera Shop on Holywell Hill
Showroom open
9am - 5.30 pm Mon - Sat Thursday late 'til 8pm
☎ (0727) 40303 Fax (0727) 60263
(Answering machine from 5pm)

News in brief

■ Oxfam has launched a major appeal for computer software through its shops in the London area. In particular, the organisation is interested in any games, leisure or entertainment software for any type of machine.

Donations can be made throughout June and July at any Oxfam shop anywhere in the country. It's hoped the majority of the items will be sold at selected London shops during a special computer promotions month starting 27th June.

■ Special Needs Software is giving away free 1000 packs of its *Wordwise Plus Literacy Pack* worth £60 to anyone engaged in adult literacy work.

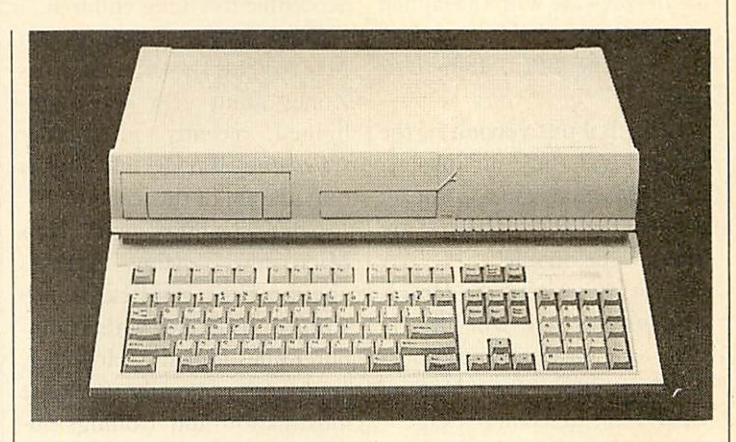
The package consists of a wordprocessor for the BBC model B, B+ and Master together with self-study material and a range of software discs. Special Needs Software has been able to distribute the software free due to a donation of £50,000 by an anonymous charitable trust.

Anyone engaged in adult literacy, who is interested in obtaining a copy of the pack should write briefly to Mr Alan Clarke, Learning Technology Unit, Room W533, Training Agency, Moorfoot, Sheffield S1 4PQ.

■ Acorn has developed Risc OS versions of its language packages. Release 2 versions of Ansi C, ISO Pascal and Fortran compilers are now available. The Ansi C compiler includes a new interface library which gives access to the multi-tasking features of Risc OS. Linkage of separately compiled modules, import/export functions and in-line assembly statements are some of the enhancements to ISO Pascal. The upgrade price for the release 2 compilers is £30, while the new user price is £99. Acorn can be contacted on (0223) 245 200.

New A3000 attracts hardware makers

After the exclusive unveiling of the new Acorn A3000 in *BAU* last month, hardware manufacturers have wasted no time in planning a new range of add-ons to augment the new machine and although compatibility is a major selling point for any machine, the design of the A3000 is quite different from existing models in the Archimedes range.



Pres is releasing a plinth and external disc drive case (right) for the A3000 and a podule case which can be expanded to accommodate five podules including extended Rom and Ram modules. Watford Electronics has plans to develop a memory expansion board for the new machine.

Beebug has developed a Hayes compatible internal modem podule which is expected to sell for around £200. The modem features baud rates up to V22 Bis (2400 baud), plus auto-dialling and auto-answer.

Mass storage is popular among many manufacturers. Oak Computers intends to supply a range of hard disc systems, and Beebug has produced a disc buffer for 5.25 and hard disc drives.

BAU show update

Over 45 companies have already taken stands for the *BBC Acorn User* show which will be held at Alexandra Palace between the 21st and 23rd of July.

The new Acorn A3000 exclusively featured in last month's issue will no doubt be a big crowd puller, and several companies will be demonstrating products for the new machine.

Computer Concepts (stands 34/36) is to launch an A5 'junior' version of the Scan Light scanner. It is hoped to have this on sale at the show for £189. Also demonstrated on the Computer Concepts stand will be the much awaited *Impression* DTP package.

Pres is committed to the A3000 with its plinth and disc expansion products. Electron users will be interested in the Pres *Basic Editor Plus* which incorporates features beyond Acorns' offering including the ability to pack code.

A small computer systems interface (SCSI) hard disc upgrade for all Arcs allowing up to four 512Mb Winchester drives to be attached to each machine will be demonstrated by Oak Computers.

Oak will also have a major revision of its parametric design tool (PDT) that incorporates extended functions.

Clares Micro Supplies will launch a sound sampling package for all Archimedes models. At £80 *Armadeus* can read an entire ST disc into memory. Using the zoom facility, waveforms in memory can be edited and saved to disc. A Risc OS version of *Proartisan* with several new features including spray can, grid lock and a sprite plotting routine will also be on show.

Beebug is competing with Computer Concepts with a preview of its own DTP system at the show. An A6 hand-held scanner costing around £200 will also be on its stand together with a new hard disc backup and utilities package for the Archimedes and the latest version of its disc drive buffer.

Of course all your old favourites such as Slogger, We Serve, Watford Electronics, Hybrid, Dabs Press and many more will be at what is set to be the best Acorn show ever. Tickets for the show cost £3.50 for adults and £2.50 for children but if you buy in advance there's a pound off the entrance fee.

To get your tickets send a cheque or postal order to Safe Sell Ltd, Market House, Cross Road, Tadworth, Surrey KT20 5SR.

Expanding your castle

Data Design aims to build on the success of its *Designer Castle* software with the launch of a follow-up, *Medieval Village,* at the *BBC Acorn User* Show.

A ready-built version of the village will be on display. BBC Master and Compact versions of the software are hoped to be on sale.

Existing users of the *Designer Castle* package will already have the printware support Rom, making the *Medieval Village* an extension package.

Data Design's education liaison officer, Vic Wright, explained the concept of linking the two:

'They are intended to be complementary packages, both showing the use of 2-D design onscreen with 3-D output,' he said. 'They can be used as part of a primary school project but are challenging enough for GCSE level and would be ideal for model builders.'

The *Medieval Village* will cost approximately £30. For further details telephone 0484) 653176.

Diary Dates

20-22 June. *Electronic Publishing & Print Show,* Wembley Exhibition Centre, London. Tel: Blenheim Online, Tel: 01-868 4466.

7-9 July. *Interactive Learning 89,* Glasgow University. Tel: Interactive Learning Association, (0773) 824226.

21-23 July. *BBC Acorn User Show,* Alexandra Palace, Tel: Safesell, (0737) 814060.

11-12 September. *Econet 89,* Manchester Polytechnic. Tel: Acorn Computers, (0223) 245200.

18-19 September. *Educational Networks 89,* Newman College, Birmingham. Tel: LTS, (0386) 792617.

Dirty data

Offensive and explicit pornographic material is flourishing on UK bulletin boards, easily accessible to young children.

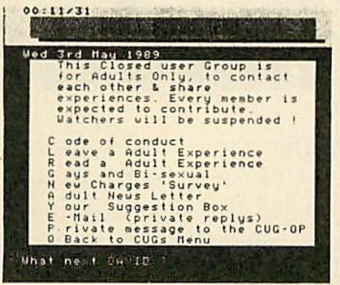
The erotic messages in Microview!'s Erogenous Zones adult area was highlighted recently in *Popular Computing Weekly* but this is only the tip of the iceberg.

Chris Rollings, who runs Microview! claims to cross check the applicants to Erogenous Zones with a computer questionnaire. However, applicants can easily give false information and Rollings admits under-aged users 'easily slip through'.

Other erotic bulletin boards like CCL4 and Heartbeat make little or no effort to check out ages of potential new members. CCL4's After Dark adult area is run by James Lawson, himself only 16!

'I haven't the time to check people's personal details', he said, 'I'm at school all day. It's only entertainment and should be taken as just that.'

To join Heartbeat potential members must complete an on-line application form giving age and sexual preferences. Again, no attempt is made to verify the information before allowing access.



MP Emma Nicholson has asked the Home Secretary to oppose the use of computers for obscene and racist purposes. 'It's not the medium but the offensive content which matters' she said.

However, Superintendent Les Bennett, head of the Obscene Publications Unit at New Scotland Yard, warned that stopping such activities would prove difficult.

'Before we can do anything we need proper evidence,' he said and he suggests parents who catch children looking at pornographic material should report it to their local police station. 'I would discourage anyone from trying to get into these kind of bulletin boards from both a moral and legal point of view.'

Christina Neal

Weather on Ceefax

Satellite weather pictures are available as telesoftware on Ceefax thanks to a joint venture between the Met office and the BBC. Currently a week's pictures are available with the most up-to-date being a day old.

To view the data, a special downloader and display program are needed, and these can be downloaded with a standard decoder. The display program converts the data into mode 2 screens which show cloud position and thickness. A further display program for the Arc displays the clouds in 16 grey levels.



The service provided by Ceefax is by far the cheapest method of obtaining a satellite picture.

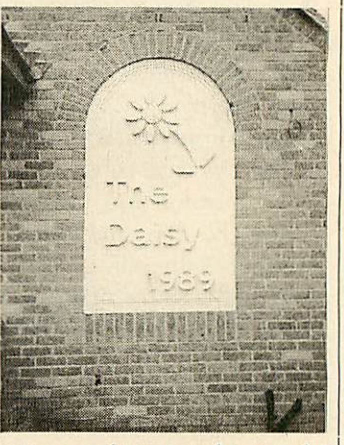
The Met Office can be contacted on (0344) 420242.

How to make a plaque

John Schofield of Elsensham, Bishop's Stortford has put his Archimedes to novel use and constructed an impressive nameplate for his house.

Not content with letting a professional do the work, John used his Arc together with *Signwriter* and *Artisan* to design the lettering and daisy.

Once the artwork was complete, the words and the flower were printed using a dot-matrix printer and traced onto a polystyrene base and a 'negative' produced by cutting out the shapes.



With the aid of Sid, the local plasterer, the negative was pinned onto the wall and the gaps filled in with a cement mix. Once dry the polystyrene was torn away and the letters painted.

Masters for Cyprus

Acorn has donated six Master 128s to Mencap. In turn the machines have been donated to the Christos Stelliou Ioannou Foundation, which will send them on to Cyprus. The organisation hopes to expand into an international training and resource unit.

The Master will be used by adults with learning difficulties to develop computer skills.

Acorn Computers Ltd. is already established worldwide with its high performance quality computer systems and is the only company in Europe to have developed its own RISC processor. We are constantly striving to improve existing products and have an impressive development programme for new products and new markets. As an Acorn user you may have the skills we need to ensure that our programme stays on course.

PROJECT PLANNER

Responsible for the collection, processing and analysis of resource information across multiple projects, you will be required to assess the implications of changes to plan, both with effect to timescale and budgets.

You should have experience in computerised resourcing with good exposure to project costing. Artemis system experience will be highly beneficial.

Self-motivated with good communication skills, you will be involved in briefing and advising Project Managers on all aspects of project plans and presenting the status of development activities to project meetings.

Ref AU/AC/010

TECHNICAL AUTHOR

At least 3 years' technical publications experience in the micro-computer or software industry is required for this role. You will be agreeing documentation requirements with Product Management and taking the specification through to the completed manual. En route, you will be liaising with R&D, graphic designers, typesetters and printers, ensuring that the final publication is delivered on time and to the required standard.

Ref AU/PG/004

GRADUATE PROGRAMMER/ ENGINEER

A wonderful opportunity for a Computer Science graduate with experience of 'C' to join the Advanced Research and Development group. The work involves providing software support for hardware development and activities, including writing test software for hardware prototypes. Knowledge of the BBC and Archimedes product range would be useful, but above all we seek candidates who are young, keen and willing to learn.

Ref AU/SF/011

DESIGN ENGINEERS/ SENIOR DESIGN ENGINEERS

Our hardware development team is expanding and we seek engineers at all levels to design and implement electronic hardware to project specification and timescale.

Areas of specialist knowledge required include TTL and high-speed CMOS logic, PAL and PLA type programmable logic, and BASIC, C or Assembly language programming. Applicants should possess a minimum of HND in Electronic Engineering and have at least two years' experience of microprocessor design.

Ref AU/MU/012

We offer sound career prospects, training to meet future needs, excellent salary packages and benefits which include assistance with relocation where appropriate.
To apply for any of these positions, please write with full career details to Mrs. Janet Henson-Webb our Senior Personnel Officer at Acorn Computers Limited, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN. Telephone: 0223 245200.



OFFERS

DTP BOOK

David Hewson's Introduction to Desktop Publishing



The second book in the Gordon Fraser Desktop series is now available and is a must for anyone interested in DTP.

Desktop publishers can save a great deal of money and time if they have the right system. Choosing this system is not easy. There is intense competition in the field of DTP, and developments are taking place at a bewildering rate. This book aims to give the buyer all the information required to make exactly the right selection. It contains clear explanations of: what desktop publishing is; the type of publications that are ideal for the process; the many uses of DTP systems; businesses to which DTP is suited; the skills required.

David Hewson is the founder and publisher of *The Wordsmith*, a bi-monthly magazine for writers and publishers using new technology.

Introduction to Desktop Publishing is available through *BBC Acorn User* for only £12.50.

Please send me_________ copies of *Introduction to Desktop Publishing* at £12.50

I enclose a cheque made payable to SPA BOOKS LTD.

NAME ____________________________

ADDRESS ____________________________

________________ **POSTCODE** ________________

Please return this coupon with your remittance to: DTP Book offer, *BBC* Acorn User Merchandising, 20-26 Brunswick Place London N1 6DJ.

CAL for more funds

Dr Noel Thompson (NCET), speaking at the CAL 89 Conference in Guildford, called for a consistent level of funding to enable the continued integration of new technology into schools. He emphasised the need for sensible strategies on the part both of local and national government to promote IT and called for sensible standards of design which will meet the needs of the user in the classroom.

He was concerned at the diversification of environments across a wide range of computers and felt that there was a place for common ground rules in the creation of software. He frequently cited the Apple Macintosh user interface as a 'useful standard' – something which did little to endear him to those members of the audience from the ranks of Acorn and Research Machines.

The conference, attended by two hundred and fifty delegates from all over the world, examined the issues of computer assisted learning in a wide variety of fields of research and development.

The next CAL conference takes place at the University of Lancaster in 1991 and possibly in Cambridge in 1993.



Perhaps there is money to be made out of educational software. The success of *Designer Castles* has allowed the proprietors to invest in Porsches which they parked prominently next to the CAL exhibition hall. Unfortunately, the university authorities were less impressed than the delegates to the conference and they created a rather attractive conversation piece in the central concourse area by clamping the cars!

Longman reshuffle

News that Longman is cutting back the software division and has axed the jobs of both top men – Roger Watson and Michael Spincer – has come as a surprise to many observers.

The move comes at a time when Longman is moving into other areas of collaboration on software and seems to indicate a lessening of emphasis on the importance of the software side of its operation. Nonetheless, there has been little diminution of activity on the new software front, with the launch of *Hyperbook* which was developed jointly with Logotron.

Moreover, Longman's largest supplier of new materials, the *Computers in the Curriculum* project in Chelsea, has recently received proofs of soon to be released material.

However, an indication that Longman was being cautious of any involvement with new projects and cutting back commitment to software publishing was mentioned in this column in *Acorn User* July 1987. In that article it was stated that Longman was pulling out of its commitment to fund development projects at Loughborough University as it claimed that costs for new projects ran well above the £30,000 mark.

That figure is now considered to be conservative by most developers and publishers yet, at the time, Longman's replied to the article saying the costing was nonsense. Since it had been offered as information at a conference at Loughborough by Roger Watson – Longman's man in charge of software – this seemed strange.

The end result is not to anyone's satisfaction. A major publisher is seen to be evaluating its position and the remaining publishers close ranks. How long before our educational software industry has disappeared out of sight altogether?

It's easy to speculate on the courses but it seems likely the sharp decline in everyone's software sales due to the lack of a sensible DTI Software Support Scheme (despite the funding of lashings of 16/32-bit hardware) has something significant to do with it. DTI/DES – take note!

■ Fernleaf Educational Software, in conjunction with Heritage and Heraldry, is holding a competition for primary and secondary schools. Entrants must design a shield (not a copy) using either Fernleaf's *Shields* software or any other graphic design package. In addition they must then reproduce their design in conventional materials.

The winners will receive, amongst other prizes, a replica of their shield design, a custom-made coat of arms for the school entrance and a £50 voucher for Fernleaf software.

■ CWDE Software (Centre for World Development Education) has now released its *World Development* database which has files of information relating to 125 countries. Life Expectancy, Adult Literacy, Populations Growth and GNP per capita can all be searched and the system is available in *Grass* or *Quest* format. Details from Elisabeth Segall of CWDE on 01-487 7410.

■ MEU Cymru – the Welsh Microelectronics Centre – has released its latest catalogue of translated software. This has been distributed free of charge to all Welsh schools and is available on request on (0222) 561231 ext 260. MEU Cymru has an excellent range of bilingual booklets on the subject of integration of IT into education. Its lively information pack and newsletter should be required reading by all Welsh teachers.

■ Another 'vital' resource is *Computer Software for Reading and Language* produced by the University of Reading School of Education. Authors Christine Robson and Julie Radford have gathered together reviews of over 100 software evaluations. These list title, publisher and price and describe the nature and content of the software. The book costs £3 and should be indispensable to advisory teachers, resource centre managers and classroom teachers of English at all levels.

Nick Evans

The RISC USER ARCHIMEDES TOOLBOX



The Full Screen Disc Sector Editor

A powerful utility for the Archimedes offering:

MEMORY SEARCH
a full screen editor which enables you to find a sequence of bytes, words or characters quickly and easily.

MEMORY EDITOR
with the help of this you can examine and alter memory in either hex or ASCII mode.

DISASSEMBLER
this command displays the contents of memory as ARM instructions including floating point and co-processor mnemonics.

DISC SECTOR EDITOR
a most helpful command for examining and changing disc contents directly. Ideal for repairing corrupted discs and recovering lost files.

- FILE FIND
- FILE GO TO
- MEMORY DUMP
- FILE COMPARE
- EXALL
- CATALL

JUST ONE OF MANY...

This is just one of the many useful programs that subscribers have received free in RISC User magazine. Each issue is crammed full of:

- hints and tips on programming the ARC
- handy utilities
- smart graphical routines
- useful applications
- tutorial articles on getting the most out of your Archimedes
- plus reviews of all the latest for your machine.

SPECIAL OFFER

Subscribe NOW to RISC User and you can get the ARCHIMEDES TOOLBOX disc at the members price of only £3.50 + 50p p&p
The TOOLBOX disc is available to non-members for **£15.00 + 50p p&p**

OTHER BENEFITS...

When you subscribe to RISC USER you get 10 magazines a year, dedicated solely to the Archimedes and full of new ideas, stimulating articles and programs, mailed to your home plus:

- free membership to our user group,
- free help from our technical support team,
- showroom with friendly knowledgeable staff,
- swift mail-order service,
- significant discounts on our own software range and 5% discount on a wide range of other products,
- trade-in service to upgrade your system

RECENT ITEMS MISSED BY NON-SUBSCRIBERS

Multi-Tasking with RISC OS
Acorn's Ray Tracer
Using the RISC OS Text Editor
Real Time Image wrapping
ADFS File Find Utility
The RISC OS Desktop
Animation Techniques
Fractal Scenery
Using the ARM Assembler
Movie Maker Animation
Writing ARM Utilities
Sprite Manager Utility
Building-up Procedure Libraries



Order Form

Please supply the Archimedes TOOLBOX disc and documentation
for the members' price of £3.50 + 50p p&p ❑
non-members' price of £15.00 + 50p p&p ❑
I would like to subscribe to RISC USER Magazine and Support Group at £14.50 (UK) ❑

I enclose a cheque for £________ *(all cheques must be in pounds sterling, drawn on a UK bank)* or,
Please debit my Access/Visa account No. ____________
Expiry Date____/____/ Signature____________
Name____________
Address____________
____
Mem No (if member)____________

RISC USER SUBSCRIPTION RATES (1 YEAR)

£14.50	UK, BFPO, Ch.I.
£20.00	Rest of Europe & Eire
£25.00	Middle East
£27.00	America & Africa
£29.00	Elsewhere

Send to:
BEEBUG LTD Dolphin Place, Holywell Hill, St. Albans, Herts AL1 1EX. Tel. St. Albans (0727) 40303, FAX (0727) 60263

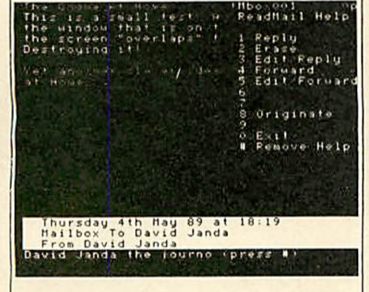
All on the up

One of the major attractions of joining Microlink has been the tariff structure, which until now has been significantly cheaper than the rest of Telecom Gold.

However, due to 'increasing costs', Database Publications (which runs Microlink on the Telecom Gold database) has been forced to revamp the pricing structure.

The good news is that connect time charges have been reduced from 11p peak and 3p off-peak to 5p peak and free access off peak respectively. This compares favourably with the rest of Telecom Gold which charges its subscribers 6.5p peak and 2p off-peak.

The bad news is that the monthly standing charge of £5 has now been increased to



£7. However the really bad news is that Microlink has fallen into line with the rest of Telecom gold and introduced a data charge.

The cost is 4p peak and 1p off-peak for every block of 512 characters sent or received by Telecom Gold.

It's been on the cards for some time now that Telecom Gold will eventually introduce 2400 baud access with MNP level five. This would effectively mean that subscribers with suitable modems will spend far less time on-line.

Nevertheless, the introduction of the data charge will ensure that no matter at what speed you access Microlink, you'll still be charged the same amount for data you either send or receive.

All very fair you may think but a major attraction of Microlink was the lack of any data charge. This was reflected in the type of service provided with large volumes of text available to read on-line. The data charge will put off many subscribers from browsing around the system and looking at these areas and that isn't good for anyone.

Gnome mail commands

The Gnome at Home (viewdata on 01-888 8894) now features extended mail commands. Besides being able to send and receive mail, subscribers can forward mail items, edit the original item before sending on and other fancy things.

When using the on-line editor, pressing # will display a non-destructive window that lists the commands available. Selecting an option will execute the command and close the window – neat!

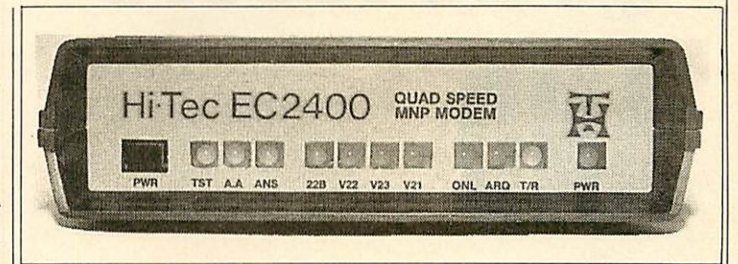
IPSS increase

Educational establishments and serious comms enthusiasts making data calls to the US tend to use the IPSS data network which works out cheaper than calling direct.

This has all changed now as British Telecom has scrapped the time charge. In its place is a revised data tariff.

The new charges are 0.28p per segment for European calls, 0.70p for North American calls (including Canada) and 0.82p per segment for the rest of the world.

For IPSS users who use interactive services (such as the CB simulators) their IPSS bills will be reduced as there is no time charge and very little data is transferred.



However, for those who transfer text or binary files, the new data charges will be an absolute killer. Just take the following example of an IPSS call to the US.

Typically, an average segment is 40 characters in length. Connected to a service at 1200 baud and downloading a file with Xmodem at an average of 110 characters per second, that's 6600 characters per minute, or 165 segments per minute – all of which comes to an astonishing £115.50 per minute!

Should you use a 2400 baud modem or (God forbid) one with MNP data compression then the costs will be absolutely astronomical. In fact it will be far cheaper to call the US direct. . . .

Phantom modem

For £160 the Microlink multi-speed modem has been the cheapest 1200 baud, Hayes compatible unit on the market. However, I now understand Spectre Communications is selling a modem with a similar specification for £149.45 inclusive of VAT. No details were available at the time of going to press, so to find out all about it just call Spectre on (0931) 5362.

Taming the beast

An absolute must for any serious comms enthusiast is a V22 bis (2400/2400) modem. However such beasts tend to cost rather a lot because the method of transmitting data over the PSTN is completely different from that of a V22 (1200/1200) modem.

All this has changed now. Thanks to a new modem chip from Western Digital and some ingenious design work, Hi-Tec Supplies is selling a V22 bis modem (unapproved) for £279 all-in.

Not only does it feature all speeds up to V22 bis, but it also has MNP error correction to level four and MNP data compression to level five. Call Hi-Tec on (0733) 52440.

Arc telesoftware

The Arc now has a telesoftware section on Micronet. Currently there are only three files available, two weather maps and a simple cassette inlay printer.



If you have any comms news please send it to David Janda at BBC Acorn User *or contact him on Telecom Gold 81:RED001 or via Prestel 942876210.*

QUESTIONS AND ANSWERS

If you have a problem with an Acorn micro, commercial software or a program you are trying to write then *BBC Acorn User* can help. The *Post A Problem* service guarantees to give you an answer within 10 working days for just £4.

Write out your problem with as much detail as possible and, if a program is involved, include a disc or cassette. Fill in the coupon at the bottom of this page and send it and your problem along with a cheque or postal order for £4 (including VAT) made out to Redwood Publishing. If you want recorded delivery add on the cost of this.

Please note that debugging readers' own programs or those from other magazines is a complex task and we cannot guarantee to give a full solution. Unless the problem can be spotted quickly, the Post A Problem service will only be able to make general comments. The service will answer the problem and return all material received within 10 working days of receipt. If we fail to match this promise then your cheque or postal order will be returned – you can't lose!

BBC ACORN USER READER SERVICE
20-26 Brunswick Place, London N1 6DJ.

NAME ____________________

ADDRESS ____________________

____

____

POSTCODE ____________________

DAYTIME PHONE NUMBER ____________________

I enclose a cheque/postal order for £4 made out to Redwood Publishing and an sae with my problem.

OFFICE USE ONLY Date in:
Date out:
Answered by:

PIN MONEY

I have an Epson FX-80 printer which has worked very well for a number of years. Recently it has started to print with a gap running through the middle of the letters. Can you please tell me what I could try to fix it before taking it to a dealer for repair?

The fault with your printer is most likely due to one of the printhead pins being blocked.

This is probably due to ink from the ribbon clogging up the hole it normally travels in. You should be able to fix the problem yourself if you carefully remove the printhead and clean it in alcohol (the sort sold for cleaning cassette and video heads is suitable).

If this doesn't clear up the problem, the fault is probably more serious.

It could be that one of the printhead pins has broken or the solenoid which activates the pins has developed a fault. You will then have to replace the printhead, either yourself or by taking your printer to a dealer for repair.

SEEING DOUBLE

I have a single double sided Mitsubishi disc drive. I want to fit a second drive and configure this new drive as 1 and 3 and the old drive as 0 to 2. I have heard this is possible by altering the links inside the new disc drive casing. Can you tell me in more detail what I need to do?

You are quite right that to make the second drive operate alongside the original you will have to alter the internal links. This will be in addition to connecting the two drives together.

Take off the new drive's metal casing and you *should* find a set of links. This should be labelled 0, D0 or S0. You will need to move this link so that the link labelled 1 (or D1 or S1) is made.

As well as altering the links you should look for a resistor pack (which *looks* rather like a ceramic IC). On a dual drive system this resistor pack is not needed. It only has to be present in a drive that is at the end of a cable.

MOVING AROUND

I am developing some software that really does need to use the full 64K of memory usable with the disc version of BBC Basic called Basic128. I want to copy the program off the Welcome disc onto my own working disc but I am having trouble trying to do this. I cannot get *COPY to work. What should I do?

Copying BAS128 and BASobj onto your own discs is not that difficult if you are aware of the commands required.

The BBC Master 128 and the Master Compact Welcome disc are in ADFS format. The *COPY command in ADFS will copy a file from one directory to another but not from disc to disc like *COPY does when using the DFS format. You have to use the *MOVE command.

Unfortunately Acorn has not documented these commands very well in the Master series manuals. The correct syntax for the kind

of move you require is:

```
*MOVE -ADFS-:0.LIBRAR
Y.BAS128 -ADFS-:1.BASIC1
28

*MOVE -ADFS-:0.LIBRAR
Y.BASobj -ADFS-:1.BASICo
b
```

If the copy operation takes place within a given filing system it is not necessary to specify the filing system (although in this example we have).

CLOSER SIMULATION

I am having problems trying to run Microsoft's *Flight Simulator* version 3 on my BBC Master 512. *Flight Simulator* loads in black and white and appears ready to start but the keyboard is inoperative. The instrument panel seems live as the values update themselves from time to time.

The program is close to running normally. Can you offer any advice?

If you purchase IBM PC software especially to run on a Master 512 then you need to ensure the dealer will let you test the package running on your machine before buying.

You could also consult a compatibility chart such as the chart printed in the September 1988 issue of *BBC Acorn User*. Here *Flight Simulator* is listed as being compatible. However, the version of *Flight Simulator* is important! Version 2.12 certainly works but version 2.13 does not.

There is a piece of software that may help. It's called *DOS Plus Problem Solver* and is published by Shibumi Soft of R Porf Camara Sinval, 138, 4100 Porto, Portugal, for £24.95. This package aims to solve the compatibility problems of Master 512s and IBM software. It was reviewed in the May issue and Shibumi's advertisement claims it will run all versions of *Flight Simulator*.

NOT A PIPEDREAM

I have a Cambridge Computer Z88 and would like to transfer *Pipedream* files from a Z88 into *Interword* leaving them reasonably formatted. What could I use to carry out the transfer?

For transferring files from your Z88 to your BBC micro, there are a number of utilities available. These include the expensive one from Cambridge Computer and one published in the January 1988 issue of *BAU*. Z88 owners at *BAU* use this one for transferring all Z88 *Pipedream* files.

You should be able to load your transferred files into *Interword* without too much trouble. Try option 4 at the main *Interword* menu 'load text to cursor' rather than option 2 which is 'load new text'. The formatting should be all right but there will be spaces and RETURNS where you don't want them to be.

When correct formatting is essential, it is much easier to load Z88 *Pipedream* files into *View Professional* which uses the same format. However, you have to go to the expense of purchasing and learning another wordprocessor. I personally load all my Z88 *Pipedream* text into *Wordwise Plus* and run a segment program which takes out all the double spaces and returns. I then format things from scratch but at least I know I am putting in the spaces and RETURNS exactly where I want them put!

CUSTOMER HOTLINE

Welcome to another Customer Hotline column. This will be my last column but more on that later.

■ If you have ever wondered how space allocation under DFS and ADFS differs, or have been stumped by the concept of compaction, then read on!

Unlike DFS, ADFS has provision for extending files beyond the space allocated to them on a disc. On DFS, space is contiguous for a file, and each file has a space on the disc starting from a particular sector number recorded in the catalogue.

If there is space after the file on the disc, the file can expand but only until the point on the disc where another file starts, or the end of the disc is reached.

Compaction in DFS removes all free space between files. So no file (except the last file on the disc) can expand beyond the end of its final sector.

The last file on a disc may be identified as the file which comes first in a *INFO #.* operation on the disc.

In ADFS, the file storage is still contiguous (except for E format under Risc OS on the Archimedes) but file expansion beyond the end of the space available is possible.

This is achieved by physically copying the file to a different place on the disc, where more space is available. The place on the disc previously occupied by the file then becomes vacant.

The obvious corollary of this is that for a file to expand beyond the allocated space, there must be a contiguous space on the disc available of more than the space currently occupied by the file itself.

This is of particular importance in database applications where files may expand. If a file is stored so that it has to expand, the best place for it is as the last file on the ADFS disc. However, there is no simple way for the user to determine which file is last on the disc.

So in, for example, a *Viewstore* application, it is sensible for the actual file holding the database information to be on a disc by itself (in this case the D.file) and other smaller 'housekeeping' files to be on another disc.

This means that there is no obstacle to file expansion. ADFS is, in this manner, like DFS. It is possible to create files before use on a blank disc (on a Master 128 and later, use *CREATE), with the last file being created being the database file itself.

Each file will then have its own area to occupy. However, this method can backfire if one of the smaller files gets too large – it will be copied in front of the database file, potentially causing an obstacle to its expansion.

If the file tries to expand beyond its length and is physically too large to copy onto the free space available, it will report 'Disc full' or 'Compaction required'.

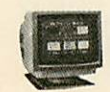
Incidentally, it should be noted that in both DFS and ADFS, compaction removes space between files.

■ As I mentioned at the beginning, this will be my last *Customer Hotline* column. However, as so many of you have thanked *BBC Acorn User* and myself for this column, I have bullied one of my colleagues into taking it over. I will leave him to introduce himself next month.

Phil Colmer

BBC Acorn User Show

BBC ACORN USER, with the backing of the BBC and the enthusiastic support of Acorn Computers, have together planned what could be the most exciting computing event of the year.



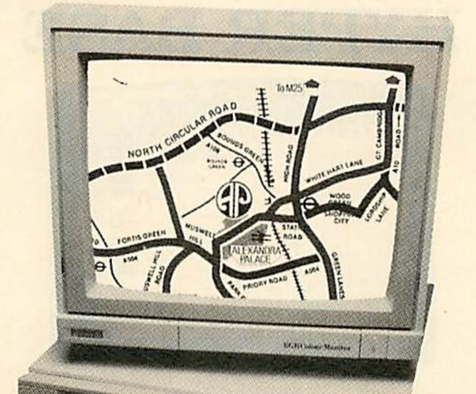
The new, all-action BBC ACORN USER SHOW is back, at the first home of BBC TV – Alexandra Palace featuring:-

- new product launches
- new software
- informative seminars
- technical clinics
- workshops
- demonstrations
- massive computing exhibition



All this and more will make the new BBC ACORN USER SHOW a real must for everyone interested in computers and their applications.

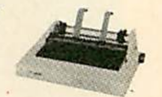
There are daily competitions, free draws with fabulous prizes to be won and celebrity guest appearances.



THE 1989 BBC ACORN USER show

ALEXANDRA PALACE · LONDON
Friday July 21st 3pm-9pm
Saturday July 22nd 10am-6pm
Sunday July 23rd 10am-6pm

Facilities at the tastefully restored Alexandra Palace are simply superb and it's so easy to get to by road, rail or tube. If you're driving you'll be glad to know there are 2000 free car parking spaces. So why not make a day of it? Apart from the beautiful grounds you'll find something interesting and exciting around every corner.





Why not save time and money by booking your ticket in advance?

Cut the coupon now and ensure your priority booking.

BOOK NOW AND SAVE

Advance Tickets: Adults £2.50 Under 16s £1.50 At the door: Adults £3.50 Under 16s £2.50

Please send me ________ Adult Tickets at £2.50 each

Please send me ________ Under 16s Tickets at £1.50 each.

I enclose cheque/PO for £ ________ payable to SAFESELL Ltd., Market House, Cross Road, Tadworth, Surrey KT20 5SR. DON'T SEND CASH.

Name ________

Address ________

____

BBC 2

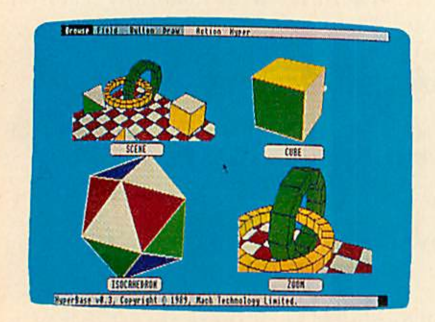
MACH

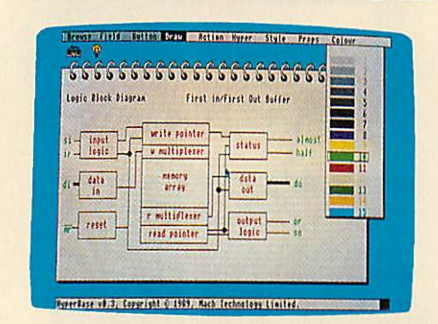
ARCHIMEDES MEMORY UPGRADES

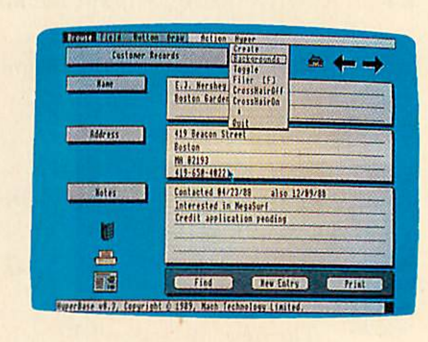
Break the Megabyte barrier with Mach Technology's 2MB and 4MB expansion boards for 300 Series machines.

2Mbyte — £340
4Mbyte — £520

HYPER BASE







An advanced database architecture supports 'cards' and 'stacks' which can contain textual and graphical information in any combination.

Cards may be connected via user defined links to allow arbitrary information networks to be constructed.

Other features include powerful search and query functions across text fields, sorts and calculations, report generation and printing and the exchange of text and graphic images with other programs.

£49.95

MODULA-2

The epitome of structured programming languages now available on the Archimedes.

* Advanced development environment
* Separate compilation
* Rapid development cycle
* System library support for Risc Os, graphics, WIMP
* Extensive documentation
* Language tutorial

£89.95

MACH BASIC

A true production quality compiler that supports the full BASIC V language. State-of-the-art parsing, analysis and code generation techniques combine to produce the fastest compiler around.

£39.95

ARC AGORA

LINEAR ACCELERATOR

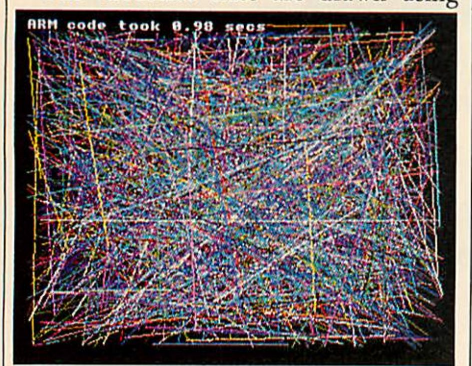
A fast line-plotting demo, coping with decimal places, a little summer snow and a word about Risc OS

David Acton

First out of the bag this month is a fast line-plotting demo from Phil Lewis of Swansea. Inspired by Dave Lawrence's speedy circles in February's issue, Phil produced listing 1 on the yellow pages and therefore earns himself £10.

Listing 1 assembles a short piece of ARM code after asking whether 'range checking' is required. Answering 'N' to this question means the code runs faster since it assumes any line drawn does not spill over the edges of the screen.

One thousand lines are drawn using



For speedy line plotting, a useful utility

Basic and then using Phil's code. The timings for each are displayed.

The ARM code responsible for point plotting is assembled by FNplot which takes a parameter that is TRUE or FALSE depending on whether range checking has been selected. This function is based on Dave Lawrence's original.

Line plotting in general works by first finding the gradient of the line to be drawn. If this is steeper than 45 degrees then a loop is used in which the y co-ordinate of the next point to plot goes up in steps of one and the x co-ordinate changes by less.

Shallower lines are plotted by increasing the x co-ordinate in steps of 1 and the y co-ordinate by less.

This is necessary to avoid gaps appearing in the lines. Phil's code does exactly this. You will note that .loop1 and .loop2 indicate the relevant sections of code.

Further refinement is possible using techniques devised by the well known J E Bresenham. Such methods as those he developed produce more accurate results, but when speed is important, routines such as Phil's come into their own.

£10

DECIMAL POINT

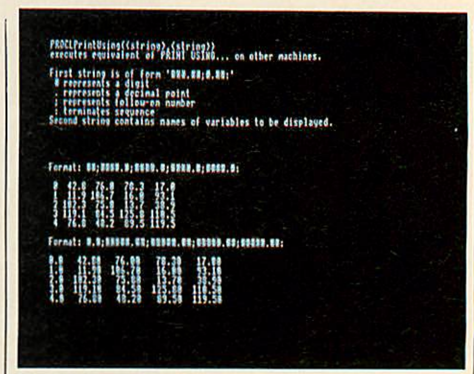
Anyone who has attempted to display values using specific numbers of decimal places will have come across the horrors of the dreaded variable @% – a nasty creature at the best of times.

Nagpal Hoysal of Bristol has provided an easier method however. He's come up with an implementation of the command PRINT USING, which is often found on other machines.

Listing 2 contains two procedures designed to be installed (using LIBRARY or INSTALL) as a Basic Library. The first, PROCLPrintUsingHelp takes no parameters and simply displays useful information. The second, PROCLPrintUsing does the work and takes two strings as parameters. The first is a 'format' string in which the following characters have a special meaning:

- # is a digit
- . is a decimal point
- ; indicates another number follows
- : terminates the format string

So, using a format of #.## the value of PI for example would be shown as 3.14. This is altogether a much more intuitive method of getting the formats right. The second string contains a list of variables (or values) to be displayed using the specified format. These names are as you would use in your program and must be separated by semi-colons, for example:



Neat tables from Basic

'loop%;i;j;k;array(4,2);'.

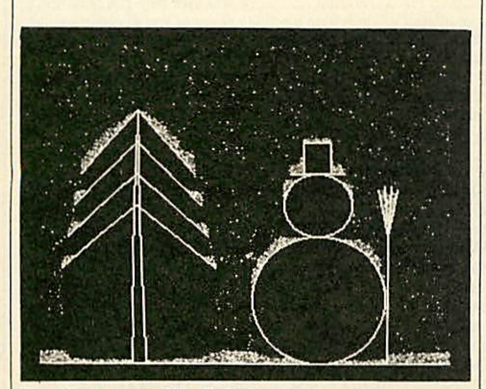
Listing 3 demonstrates the process. First, the procedures are installed. (LIBRARY "filename" simply denotes the given file as a library and subsequently, any procedures defined in that file can be called from the 'host' program. The INSTALL command performs a similar function but permanently includes the specified Basic file.)

Listing 3 calls the help procedure and builds an array of values. These are displayed using two different formats. You will note that the argument string contains all the relevant brackets since the variables you are printing are from the array called vars().

PROCLPrintUsing works in a fairly straightforward way, looking through the format string and counting decimal places, etc. The Basic function EVAL is used to extract and print the relevant section of the variable string, and @% is set up beforehand in order to determine the format used.

You will note that all of the main variables used in PROCLPrintUsing have been prefixed with 'L' so that they don't clash with names used by your own programs. Full use of LOCAL can sometimes avoid such problems in any case but such prefixing is generally a good practice anyway.

SNOW DOODLE



Doodle away with digital snow!

This month's graphic offering is a little animated doodle from the warped mind of *BAU* regular Dave Lawrence. It's . . . well . . . it's difficult to describe really – sort of digital snow. Now that everyone is a bit fed up with the original 'Game of Life', interest is turning to other sorts of 'real-life' simulation. Listing 4 illustrates the idea.

In essence, a large number of dots are dropped onto a simple landscape to see where they roll.

Use the mouse to set up the landscape in the first place: hold the left button down to draw a line, press the middle to drop a 'random' triangle and press the right button when you are ready for the shower to begin!

The main work is done by the machine-code routine .fall. Each dot continues down the screen until it can fall no further. Then, it chooses a random direction (left or right) and moves off again until it finds itself trapped.

When a dot can move no further it is left in its final resting place and a new one is created at the top of the screen. To prevent dots being stopped in mid-air by a sudden rush of other dots nearby, a counter is set up once a dot cannot fall any more. It waits for up to four frames to see if the congestion clears. If so, it moves on, if not it tries to move left or right instead.

To make things a little more interesting, dots are dropped at different speeds. The final effect is somewhat spectacular, if a little odd! Each dot has its own twenty bytes of information in the table called (unsurprisingly) table. These bytes are split into five words:

word 0	address of dot on screen
word 1	colour of dot
word 2	direction of dot
word 3	speed of dot
word 4	used as a counter by .fall

Random positions and directions are generated in the traditional way using a 'ring counter'. If you would like to set up a new landscape, by the way, press ESCAPE at any time.

There are many ways in which this little doodle could be enhanced. For example, at the moment dots will continue to move left and right until either they can fall further or are 'boxed in'. Real snow (or real anything for that matter) clearly doesn't roll along idefinitely so you might try applying a counter to a dot that stops it rolling after a randomly chosen delay.

As Dave points out, to do a 'proper' simulation, you would of course have to keep track of all the dots that have ever fallen. This would be slower but more realistic, since it would mean that if there were an unexpected 'avalanche' for example, dots that had previously come to rest could move off again into the newly created space.

£5

MISLEADING OS FILES

In April I mentioned the use of OS_File call 5 in finding the lengths of files. As one of our Agora regulars Terry Blunt points out, this is not without its hazards. The main problem is that the call does not generate an error if a file does not exist. Instead, it returns an (often enormous) file length!

Terry offers a function that performs the check – listing 5. FNsize takes a filename as a parameter and returns the length of the file if valid, or 0 otherwise.

The file type is returned by OS_File in a% and this will be the figure 1 for a file, 2 for a directory and 0 if the file doesn't exist at all.

Note that OS_File does generate an error if the filename provided is null or contains illegal characters. You might like to use SYS "XOS_File" in the function to avoid this.

CACHE POINT

Now that Risc OS is well and truly with us, I'd like to cover at least one feature of the new operating system each month. We start with a brief look at file and directory caches.

Many new *CONFIGURE options are available with Risc OS and these include ADFSDirCache and ADFSbuffers. The former is configured in K and anything up to 255K may be set aside. This space is used by the operating system to store previously explored directories in a compressed form. Thus, subsequent examination of the directories is very much quicker since the disc isn't 'whirred' each time.

Directories from a number of floppies can be cached in this way and this has its good and bad side.

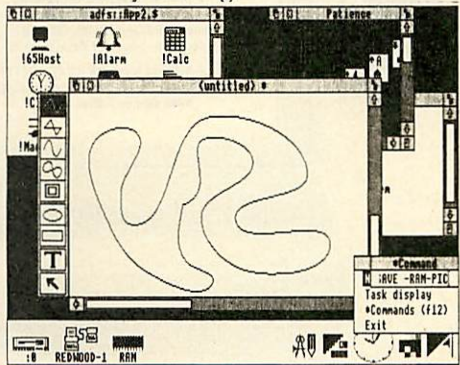
On the plus side, the operating system has more of an idea than it had before of which disc contains what. On the negative side, it can be annoying when the operating system says 'Disc not present' because the file you're trying to run on the current disc also exists on a previously inserted disc and the operating system is trying to load the other version as well!

This is perhaps an unavoidable feature of such an approach and makes the command *NOLIB very useful.

This is the command that tells the operating system to forget about any other libraries it has come across in the recent past.

The ADFSbuffers *CONFIGURE option determines the number of 1K buffers used by the operating system when handling files. I currently have 16 such buffers configured and find that just about right.

These are used by BGET, BPUT and the assortment of other filing system calls and, under certain circumstances, the space set aside may be used temporarily for directory caching.



Risc OS – a closer look each month

If you have any programs, ideas, hints and tips of use to budding Archimedes users that you think are worthy of publication, then they should be sent to: Arc Agora, BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. Up to £20 and buckets of fame await the select few who take the plunge to instant Agora adoration.

SUMMER SALE

ALL PRICES SLASHED

		N.R.P. £	SALE £
GENIE*	IN-A-BOX + CARTRIDGE	81.35	69.95
GENIE	JUNIOR	26.00	19.95
GENIE	REALTIME CLOCK FOR 'B' & COMPACT	30.90	25.99
PUBLISHER		46.00	34.95
FONT LIBRARY DISKS		19.95	9.95

* LIMITED STOCK OF BATTERY-BACKED GENIES.

All prices include VAT and U.K. postage. Prices apply until 31st July 1989. Phone our Sales Office for information sheets/educational prices/bulk purchases/ site licences.



PERMANENT MEMORY SYSTEMS
38 MOUNT CAMERON DRIVE
EAST KILBRIDE G74 2ES
03552 32796

BBC and IBM file interchange by MicroBoss Ltd

Software for the IBM PC-XT-AT or compatible:

BeebDOS ....£46.00 inc p&p & VAT
BeebDOS is a powerful set of utilities which run on the IBM computer and enable it to read and write many BBC diskette formats providing almost a complete BBC filing system on the IBM! BBC double density diskette formats supported are Acorn ADFS, Watford, Solidisk, OPUS DDOS and UDM. Acorn/Watford single density DFS are only supported with an IBM AT (or AT compatible) with 360k drive. Please send for our information sheet. Some of the utilities included are:

BCOPY Copy files BBC - IBM, IBM - BBC, BBC - BBC (wild cards & path names allowed).
BCONV Flexible IBM file translate facility enabling text to be passed between VIEW, WORDSTAR, IBM DISPLAYWRITE, MICROSOFT WORD and any programs which can import or export text files.
BGRAPH Display BBC mode 0,1,2,4,5 screen format (AMX Art included) files on IBM CGA, EGA, VGA and hercules screens for use in IBM PC presentation, DTP, drawing and other graphic applications.

BeebDOS Test Pack ....£5.75 inc p&p & VAT
This pack provides an economical method of testing whether BeebDOS will work with your IBM/compatible computer and BBC diskette format. The pack contains three of the BeebDOS utilities backing up, cataloguing and formatting BBC diskettes.

BBC BASIC to IBM BASIC translator ..£46.00 inc p&p & VAT
If you have copied your BBC BASIC programs to IBM diskette using BeebDOS this translator will assist in converting them to run under IBM BASICA, Microsoft QuickBASIC and GWBASIC. This software is of special interest to program authors who wish to convert their BBC BASIC programs to run on the IBM PC. Please send for an information sheet.

Special Offer: BeebDOS + BBC BASIC to IBM BASIC translator ....£80.50 inc p&p & VAT

BBC - IBM file transfer service

We can transfer files, BBC to IBM and IBM to BBC for you. Simply send us the disk(s) containing your files. Indicate the format of the original and copy diskette and include payment per diskette involved in the transfer. Prices as follows (inc p&p and VAT): DFS 40 track=£5.00, DFS 80 track=£6.00, ADFS 40 track=£7.00, ADFS 80 track=£8.00 ADFS 160 track=£9.00, IBM 360k=£6.00, IBM 720k=£7.00, IBM 1.2mb=£8.00 and IBM 1.44mb=£9.00.
The cost of the copy diskette is included in these prices. So for example to copy files from one BBC DFS 40 track to one IBM 360k diskette will cost £11.00 (£5.00+£6.00) inc p&p and VAT and we return the original together with the copy. We cannot accept responsibility for any loss of data so please ensure you have taken a backup copy of any diskettes you send to us.

PAYMENT BY CHEQUE OR ACCESS TRADE/EDUCATION ENQUIRIES WELCOME
MICROBOSS LTD 3 HADLEIGH RD FRINTON ESSEX CO13 9HG TEL(0255)671095



ECONET Network approved supplier and installer



FINANCE ON
Archimedes

35 Rushleigh Green, Thorley Park, Bishops Stortford, Hertfordshire CM23 4JH



AJL ELECTRONICS
(G6FGO)
Telex 9312131611 AL G

Acorn Approved Dealer for Glos/Worcs

Wellington Pde. Gloucester.
Tel: 0452 20474

Stockists of:
ARCHIMEDES 310 and 440
Master 128
Compact 128
BBC Model B/BD/BDE
Electron

Price match available with any other APPROVED dealer.
Suppliers to Education/Industry/ Health Service etc
* Repairs to Acorn products on site
* Full technical backup service
* Demonstration machines available

Software Disc drives Monitors Modems
2nd Processors teletext adaptors

Satellite system decoders now in stock. Phone for details

Printers Discs Paper Ribbons Connectors
Spares Rom cartridges
BBC B issue 7 Boards £79.95 Limited Offer

AJL EBBS 0452-309125 V21 V22 V23
Scrolling (8n1) & Viewdata

HINTS & TIPS

IMPROVE YOUR IMAGE

How to successfully load Rom images into Sideways Ram, plus printable *Stop Press* fonts and tips on using *View*

[redacted]

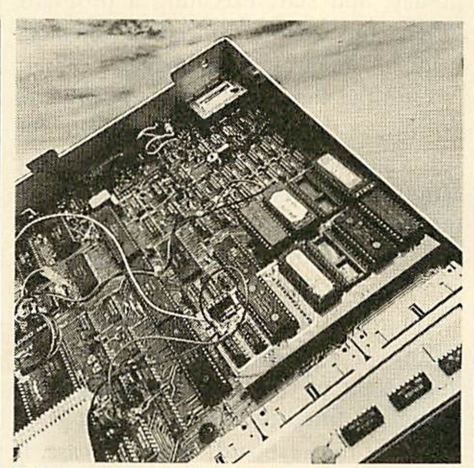
David Atherton

A lot of people have asked me about loading Rom images – disc copies of Rom software for use in Sideways Ram – in !BOOT files, and why certain operations using them sometimes fail, especially if the Rom requires workspace.

A good example of successful Rom image loading is the !BOOT file supplied with *AMX PageMaker* Master 128 disc version – this loads the program into Sideways Ram, reboots the system, and then runs the !BOOT file again, but somehow 'knows' that the Roms are now installed, and does something different the second time around.

Loading sideways Roms with a !BOOT file should be simple enough – just *LOAD or *SRLOAD the relevant file, and then issue the appropriate commands to start up – for example if a copy of the *View* Rom was saved on disc as VIEW, you should be able to issue *SRLOAD VIEW 8000 4, followed by *WORD. However, it isn't as simple as that. For a Rom image loaded into Sideways Ram to work, three other things must happen – firstly, the Rom table located at &2A1 in memory must be loaded with the Rom 'type byte' (stored at location &8006, the seventh byte in the Rom), secondly any workspace needed by the Rom must be claimed, and finally, any vectors set by the Rom at startup must be in place. To simulate these last two actions for any specific Rom is possible, although not always easy, but to write a general purpose routine for any Rom is almost impossible. The usual solution after loading a Rom image into Sideways Ram is to press CTRL-BREAK, which will initialise the Rom fully. The problem is, how do you simulate CTRL-BREAK with a command, and then how do you make the system 'carry on' after the command?

The simplest method of simulating CTRL-BREAK, which works with all versions of the BBC micro and Master



Sideways Ram: loading isn't so simple

Series, and all operating system Roms, is to instead simulate a power-on reset. 'Soft' Break, the action taken when you press the BREAK key without CTRL, can be more-or-less simulated by a machine code jump to the address contained in memory locations &FFFC and &FFFD. In Basic this would be CALL (!&FFFC) AND &FFFF, although the shorter CALL!-4 works just as well. However, a soft break does not fully initialise the Roms. To make this into a power-on reset, the command should be immediately preceded with *FX151, 78, 127. This *FX command, which is equivalent to setting location &FE4E to &7F, sets a special bit on the slow data bus (system VIA), which is normally set in hardware for a few milliseconds when the machine is powered up. It is this bit which is used to detect the different between power-up and hard resets. You will find that issuing this command cause all I/O to hang up, so you can't issue CALL !-4 from the keyboard. Don't worry though, commands following the *FX call in and *EXEC file (provided the next command is within the same 256 byte block of text and therefore read from buffer not disc) or even a Basic program will work correctly. The reset performed by these two commands will correctly initialise sideways Rom images loaded into Ram. It will however wipe the rest of the Ram in the machine.

However, we can rely on the operating system itself to provide the necessary information. During normal initialisation, type bytes, as mentioned above, are set up in locations &2A1 to &2B0, for each valid Rom image found. For those slots which are not found to contain a valid Rom, the relevant entry is zero. This can be utilised in the !BOOT file – before a Rom image is loaded, the table can be tested to see if the Rom is already loaded, and if so, the next stage can proceed.

This is the !BOOT file to load *View* into Sideways Ram slot 4, *ViewSpell* into slot 5, and *CommStar* into slot 6.

```
    VDU 21
    *BASIC
    IF ?&2A5<>0 THEN *EXE
C !BOOT2
    *SRLOAD VIEW 8000 4 Q
    *SRLOAD VSPELL 8000 5
 Q
    *SRLOAD COMSTAR 8000
6 Q
    *FX 151 78 127
    CALL !-4
```

VDU output is switched off – purely for appearance's sakes, it is not necessary to the function of the commands, and Basic is entered, so that the IF statement can be used. Only the first Ram slot is checked by testing the value of &2A5, which contains the type byte if any for the contents of slot 4. We have just reset the machine with SHIFT-BREAK, so if &2A5 does not contain 0, there must already be a valid Rom image in sideways Ram slot 4. If this is the case, an auxiliary !BOOT file, !BOOT2 is run instead. Otherwise, the three Rom images are loaded from disc in turn to their respective sideways Ram slots, and then the commands which force a 'power-on' reset are issued. Of course the *STLOAD commands specific to the Master Series are BBC 1770 DFS –

you may have a different command, or indeed a program to load your Rom images. Any other commands will work, so long as after loading, the two commands which cause a reset are issued.

The CALL !-4 causes the machine to reset, and of course it goes through the same procedure again, executing the !BOOT file – it can do nothing else. This time however, the Rom banks are full of code, and so even before the !BOOT file execution began, the operating system has set up the Rom table – so when the test is made in the second line of the file, &2A5 is found to contain the type byte for *View*, a non-zero value, and so !BOOT2 is EXECuted. The BBC operating system only allows one EXEC/SPOOL file to be open at once, so !BOOT is automatically closed and the remaining Rom loading and resetting commands are discarded. !BOOT2 switches back on video output to display a short message – more on this in a moment – and sets up function key 0 with the desired task, in this case to CHAIN a progam called START. Notice how a CTRL-F is placed at the start of the function key string to switch video output back on. Finally all buffers are flushed and the command is inserted into an known empty buffer:

```
   PRINT CHR$6;"Release
the SHIFT key now"''CHR$
21
   REPEAT UNTIL INKEY-1=
0
   *KEY 0"|FCHAIN |"STAR
T|"|M"
   *FX15
   *FX138 0 128
```

The last line, CLOSE#0, is not actually needed. When the command is executed, the EXEC file has finished, and so there is no file to close, and consequently DFS/ADFS gets confused and reports a 'Channel' error. However, I have found that in certain circumstances, if you don't issue this command, Basic programs started up afterwards get equally confused about whether any files are open or not, and although it generates an error, it doesn't harm the operation of the sequence so I have left it in. Note incidentally that the command set up on the function key doesn't have to be a CHAIN – it can equally well be a star command to start one of the Roms you have loaded.

You will have noticed that you have to hold SHIFT when first pressing BREAK to activate the !BOOT file, and that you must be holding SHIFT again, when the machine resets, so that the !BOOT file is executed again.

I have even included a couple of lines to tell you when to stop holding SHIFT, and to make this system work as it stands you must keep holding SHIFT until the screen tells you to let go.

People have asked me in the past for a fully automated system which they intend to use with a mains timer, so that the computer will come on at a certain time of day, and start executing a program. Often this setup procedure includes loading a Sideways Rom image.

With the above system it is possible to do this, as there is a facility on both the BBC micro and Master to reverse the action of SHIFT-BREAK, that is to execute the !BOOT file if SHIFT is *not* pressed, and only to perform a standard startup if SHIFT *is* pressed.

On the BBC model B and B+, this facility is controlled by the keyboard links, a set of eight dual inline switches optionally fitted to the lower right hand corner of the keyboard, under the case. If link 3 is 'on', that is, connected, then the reversal is active.

This can be overridden in software using *FX255, but any *FX255 setting is in turn overridden by the links position at a hard reset. An automated BBC system could however have this link fitted, and accordingly execute a !BOOT file as soon as it was powered up, provided there was a disc in Drive 0.

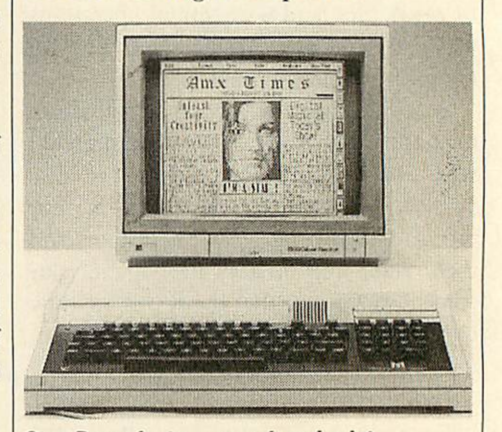
On the Master Series, the reversal is handled by a CMOS Ram (or EEPROM on the Compact) setting, controlled by a *CONFIGURE command. *CONFIGURE BOOT reverses the normal action, ie, makes the machine autoboot on BREAK without SHIFT, and *CONFIGURE NOBOOT restores the normal action.

It is even possible to set up the Master so that you still perform SHIFT-BREAK for the first time round the !BOOT file, but don't have to hold on to BREAK to do it a second time.

To do this, you would insert a *CONFIGURE BOOT command after the IF statement in !BOOT above, and a *CONFIGURE NOBOOT at the start of the !BOOT2 file. This will work fine provided you don't try to interfere with the booting process whilst testing it, for example, by pressing BREAK before the whole operation performed by the two files was complete.

£10 DOWNLOADABLE STOP PRESS FONTS

Robin Barnes, from Westcliff-on-Sea, whose article on programming the Kaga Taxan KP-810 was published a couple of months ago in this column, has written again, with a useful routine for those of you who don't want to design your own fonts, and own a copy of the AMX (now Watford Electronics) *Stop Press* package. Robin's program converts the *Stop Press* fonts (of which there are fifteen supplied with the package) into a format suitable for downloading to the printer.



Stop Press fonts – squash and print

The converter program uses a short machine code routine to rearrange the format of the pixels that make up a letter. This is then converted into a printer character by a Basic routine. The program automatically calculates the proportional data for the letter, and adds a descender where appropriate.

As the fonts in *Stop Press* are arranged on a 16x16 grid and those on the printer are effectively 16x11, it is necessary to compromise the resulting letter by squashing the data together towards the sides. As a result, some letters can appear squashed, and on bold fonts, some parts of letters may be cut off. This can be remedied by altering the references to the procedure PROCreformat (Step%, Strt%,End%). This procedure maps the 16x16 characters used by *Stop Press* on to those used by the printer. The two parameters Strt% and End% point to the Start and End columns of the section of the *Stop Press* character being converted. They can range between 0 and 15, but they must always be in sequential order. The other procedure Step% refers to the columns used on the resultant printer character. It can take a value of two or

four. With a value of four, each column on the *Stop Press* character occupies one column on the printer character. With a value of two, every two columns of the *Stop Press* character occupy one column of the printer character (the printer steps in units of half columns but cannot print adjacent dots).

The program makes three references to this procedure, the first and last of which compress the edges of the character allowing more room for the middle of the character.

Robin also provides a second program which tests the printer font simply by printing all the characters within it a little like a printer self-test routine. The procedure PROCprint (Name$) is the most useful part of the program as it is responsible for sending the codes to the printer and can be used appended to other programs, to allow them to make use of the new fonts. When prompted for the name of the font using this program, you should give the name of the converted font file, not the original *Stop Press* font file.

Once a font is downloaded, no special software is required to use it, other than the VDU command to select the font. The fonts do not take up any additional memory in the computer, and ordinary text printing software packages such as *Wordwise*, *View*, spreadsheets and so on can use them.

To use a font with standard programs, run the test program, but answer 'N' to the 'Test alphabet?' option. The program will then merely download the font into the printer, and select the font. As long as you don't reset or turn off the printer, you can now load *View*, *Wordwise*, or any other program and start printing in the normal fashion.

Your text will appear on the paper in the font you have chosen. Note that if your software resets the printer, for example to perform a graphics dump, or some printer drivers (notably early drivers for *View*) issue the VDU 27, 64 reset sequence, then the downloaded character set must be reselected by the command ESC "%" 1 0, which from Basic would be:

```
VDU 21,27,1,37,1,1,1,0
```

This can optionally, be followed by a second VDU command;

```
VDU 1,27,1,112,1,1
```

if you want proportional spacing as well, as in the test example.



Giving the Master's commands more power

£10
BASIC WITH COMMAND LINE PARAMETERS

Mr D Aylott of Buckhurst Hill, Essex, has sent a Master Series program which not only allows you to modify Basic programs so that they will run as '*' commands but also allow you to pass parameters to the program from the command line, for example *MENU 2 3. Five programs in total are provided on the yellow Pages – the first one assembles the required machine code file, and saves it under the name M.CODE. Save this as MAKE. The second is the code maker. This program appends the machine code to the end of the Basic program, and sets the appropriate execution addresses. Save it as CONVERT. The other three should be typed in and saved as PROG1, PROG2 and MENU. Next run the MAKE, which will save a file called M.CODE to disc (ADFS users should create a M directory). Then set PAGE to &3000 and run CONVERT, and convert the PROG2 and MENU programs. Now CHAIN "PROG1" and you will find that the parameters you give are passed to PROG2 and then displayed. You can also try the MENU program, typing *MENU <argument> where 0,1,2 and 3 are valid.

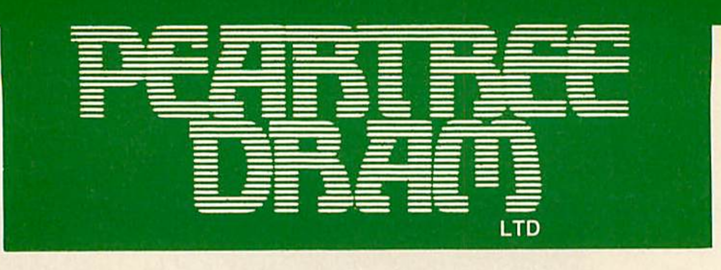
Having done this, try your own programs. Just run them through the converter, and the resultant file can be run as a star command. If you want to pass parameters, just add them to the command line after the star command, separated by spaces. The Basic program should be written in such a way that input buffers are not cleared on entry, ie, there should be no *FX15 or *FX21 commands. Each program, as though it were typed from the keyboard, and so, can be picked up by INPUT or GET statements.

The way the program works is extremely simple. The CONVERT program appends M.CODE to the end of the Basic, and alters the execution address to the file to the start of M.CODE, so that this code runs when you type the '*' command. The machine code inserts the commands OLD and RUN into the keyboard buffer, and then scans the command line for any parameters. Any found are also inserted into the keyboard buffer, and thus are treated as 'typed' when the program starts. The machine code then exits, allowing the OLD and RUN to take effect and start the program. Note that the way the CSINIT command works means that the '*' command typed is inserted as the first parameter, and your program should discard or otherwise take account of this.

Finally, note that this program only runs on the Master 128 and Compact

PUTTING · THE · FUTURE · INTO · YOUR · HANDS

24 HOURS ANSWERPHONE FOR CREDIT CARD ORDERS
0480 59026



24 HOURS ANSWERPHONE FOR CREDIT CARD ORDERS
0480 59026

Peartree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF. Telephone (0480) 50595 Fax (0480) 59026

Archimedes HARDWARE

305 SERIES

* Entry System	£ 679.00
* With Green Monitor	£ 729.00
* With Colour Monitor	£ 879.00

310 SERIES

* Entry System	£ 749.00
* With Green Monitor	£ 810.00
* With Colour Monitor	£ 999.00

310M SERIES

* Entry System	£ 849.00
* With Green Monitor	£ 910.00
* With Colour Monitor	£1099.00

440 SERIES

* Entry System	£2265.00
* With Green Monitor	£2310.00
* With Colour Monitor	£2455.00

Acorn — The choice of experience.

MASTER SERIES

*** BBC MASTER 128 £399.00**

BBC MASTER COMPACT SERIES

* Master Compact Entry System	£ 310.00
* Master Compact TV System	£ 322.00
* Master Compact Mono System	£ 365.00
* Master Compact Colour System	£ 475.00

PERIPHERALS

* Acorn Econet Starter Kit	£ 79.00
* Acorn Econet Socket Kit	£ 29.00
* Acorn Master Econet Module	£ 43.00
* Acorn Filestore E01	£ 819.00
* Acorn Filestore E20	£ 709.00
* Acorn Econet Station Lead 10	£ 25.00
* Acorn Econet Cable 100m	£ 99.00
* Acorn Master Turbo Upgrade	£ 99.00
* Acorn 1770 DFS Complete Kit	£ 49.00
* Acorn 64k Upgrade Kit	£ 27.00
* Acorn 32016 Co-Processor	£ 899.00

COMPATIBLE MICE

* AMX Mouse	£ 29.95
* Digimouse	£ 39.95

MODEM FOR ACORN COMPUTERS

* Pace Nightingale	£ 99.00
* Pace Nightingale Combo	£ 129.00
* Pace Linet Modem	£ 142.00
* WS2000	£ 113.00
* WS3000 V21/23	£ 285.00
* WS4000	£ 159.00
* Pace Series4 V/21/22	£ 360.00

CONSUMABLES FOR ACORN COMPUTERS

* BBC Master Dust Cover	£ 4.50
* BBC Master Compact D/Cover Mono	£ 7.50
* BBC Master Compact D/Cover Col	£ 8.75
* BBC Model B Dust Cover	£ 4.50
* Eprom Eraser	£ 39.95
* Eprom Programmer Up to 64k	£ 69.95

BOOKS (No VAT)

* BBC User Guide	£ 14.95
* BBC Master Ref Part I	£ 14.95
* BBC Master Ref Part II	£ 14.95
* Acornsoft View Manual	£ 10.00
* Acornsoft Viewsheet Manual	£ 10.00
* Acornsoft Viewstore Manual	£ 10.00
* Acornsoft DFS Operating Manual	£ 6.95
* Advance Sideways RAM User	£ 9.95
* BBC Advance User Guide	£ 16.95
* Master Advance Ref Guide	£ 17.95

DISC DRIVE FOR ACORN COMPUTERS

* Single Drive 400k 40/80	£ 99.00
* Single Drive 400k 40/80 + PSU	£ 119.00
* Dual Drive 800k 40/80	£ 199.00
* Dual Drive 800k 40/80 + PSU	£ 229.00
* BBC Master Bridge Drive 800k	£ 249.00
* BBC 20MB + 400k Drive	£ 799.00
* BBC 20MB Hard Disk Drive	£ 699.00

SPREADSHEETS

* Acornsoft Viewsheet	£ 36.00
* Acornsoft Viewplot	£ 22.00
* C.C. Intersheet	£ 38.00
* C.C. Interchart	£ 27.00
*** Mini Office II Disk Version**	
* For Model B & B+ 40t or 80t	£ 14.75
* For Model Master 128k 80t	£ 17.00
* For Master Compact 3.5" Disk	£ 19.00
*** Mini Office II ROM Version**	
* For B, B+ Master & Compact	£ 48.00
* C.C. The Mega 3 ROM	£ 77.00

CAD & DRAWING SOFTWARES

* AMX Mouse & Superart	£ 59.00
* AMX Superart Only	£ 43.00
* AMX Desk	£ 19.00
* AMX Utilities	£ 11.50
* AMX Pagemaker Stop Press	£ 43.00
* AMX 3D Zicon	£ 21.00
* AMX Database	£ 21.00
* AMX XAM	£ 21.00
* AMX MAM	£ 17.00

UTILITIES

* Acornsoft ADFS ROM	£ 26.00
* Acornsoft Printer Server ROM	£ 39.00
* Acornsoft Basic Editor	£ 24.00
* Acornsoft Termulator	£ 29.00

DATABASE MANAGEMENT SYSTEMS

* Acornsoft Viewstore	£ 37.00
* Acornsoft Overview	£ 77.00
* C.C. Interbase	£ 55.00

WORD PROCESSORS

* Acornsoft View Professional	£ 76.00
* Acornsoft View 3	£ 44.00
* Acornsoft Viewindex	£ 13.00
* Acornsoft View Printer D/Gen.	£ 9.00
* Acornsoft Viewspell	£ 29.00
* C.C. Wordwise Plus	£ 38.00
* C.C. Interword	£ 39.00
* C.C. Spellmaster	£ 47.00

MONOCHROME MONITORS

* Philips 7502 Green Monitor	£ 73.00
* Philips 7913 FSQ 12" Green	£ 89.00
* Philips 7923 FSQ 12" Amber	£ 99.00
* Philips 7713 FSQ 14" Green	£ 103.00
* Philips 7723 FSQ 14" Amber	£ 107.00
* Monitor Stands Tilt/SW	£ 15.00
* Samsung F12AA7 12" Flat/Sc Amber	£ 79.00
* Samsung F39A7 12" Flat/Sc Green	£ 79.00
* Samsung M430 14" Amber	£ 89.00
* Samsung M430 14" Green	£ 89.00

COLOUR MONITORS

* Philips 8801 Monitor	£ 189.00
* Philips 8802 Monitor	£ 199.00
* Philips 9053 Monitor	£ 379.00
* Philips 9073 Monitor	£ 449.00
* Philips 8833 Monitor	£ 259.00
* Philips 8852 Monitor	£ 269.00
* Microvitec 1431/MS 14" St/Res	£ 199.00
* Microvitec 1431/DS 14" St/Res	£ 199.00
* Microvitec 1431/MZ 14" St/Res	£ 239.00
* Microvitec 1451/MS 14" Med/Res	£ 249.00
* Microvitec 1451/DS 14" Med/Res	£ 249.00
* Microvitec 1441/MS 14" H/Res	£ 439.00
* Microvitec 1441/DS 14" H/Res	£ 439.00
* Hantarex M/Res 28"	£ 795.00
* Kaga Taxan Sup/770 Multisync	£ 599.00
* Samsung C452 St/Res 14" T&SV	£ 179.00
* Samsung C1412 Med/Res 14" T&SV	£ 269.00
* Samsung C1414 H/Res 14" T&SV	£ 349.00
* Samsung C431V Med/Res 14" T&SV	£ 299.00
* Samsung C431E Med/Res 14" T&SV	£ 299.00

EPSON PRINTERS

* Epson LX800 Printer	£ 199.00
* Epson LX800 Sheet Feeder	£ 69.00
* Epson FX800 Printer	£ 399.00
* Epson FX800 Sheet Feeder	£ 139.00
* Epson FX1000 Printer	£ 499.00
* Epson FX1000 Sheet Feeder	£ 159.00
* Epson EX800 Printer	£ 499.00
* Epson EX800 Scanner Option	£ 169.00
* Epson EX800 Sheet Feeder	£ 139.00
* Epson EX800 Colour Option	£ 60.00
* Epson EX1000 Duel Interface	£ 699.00
* Epson EX1000 Sheet Feeder	£ 179.00
* Epson EX1000 Sheet Feeder	£ 179.00
* Epson EX1000 Dual Sheet Feeder	£ 299.00
* Epson EX1000 Colour Option	£ 60.00
* Epson EX1000 Scanner Option	£ 179.00

24 PIN DOT MATRIX

* Epson LQ500 Printer	£ 379.00
* Epson LQ500 Sheet Feeder	£ 75.00
* Epson LQ850 Printer	£ 599.00
* Epson LQ850 Sheet Feeder	£ 139.00
* Epson LQ1050 Printer	£ 799.00
* Epson LQ1050 Sheet Feeder	£ 179.00
* Epson LQ2500 Printer	£ 999.00
* Epson LQ2500 Single Sheet Feeder	£ 179.00
* Epson LQ2500 Dual Sheet Feeder	£ 299.00
* Epson LQ2500 Colour Option	£ 66.00
* Epson LQ2500 Scanner Option	£ 190.00

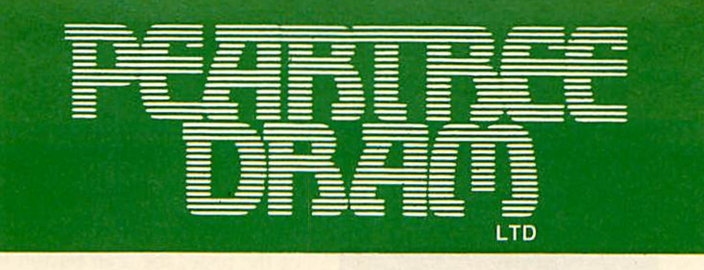
All prices are exclusive of VAT

Registered in England · Registered No. 2256150 · 6 Rother Street, Stratford-Upon-Avon

PUTTING · THE · FUTURE · INTO · YOUR · HANDS

PUTTING · THE · FUTURE · INTO · YOUR · HANDS

24 HOURS ANSWERPHONE FOR CREDIT CARD ORDERS
0480 59026



24 HOURS ANSWERPHONE FOR CREDIT CARD ORDERS
0480 59026

Peartree House, No 1 Blackstone Road, Stukeley Meadows Industrial Estate, Huntingdon, Cambs PE18 6EF. Telephone (0480) 50595 Fax (0480) 59026

MicroPeripherals Ltd

PRINTERS

* MP135 80col 135cps F+T & NLQ	£	124.00
* MP135+ 80col 135cps F+T & NLQ	£	134.00
* MP135 Cut Sheet Feeder	£	149.00
* MP165+ 80col 156cps F+T & NLQ	£	169.00
* MP165 Cut Sheet Feeder	£	89.00
* MP480 80col 480cps F+T & NLQ	£	319.00
* MP700 136col 700cps F+T & NLQ	£	449.00

DAISYWHEEL PRINTERS

* Juki 6000 Daisy Wheel Parallel	£	179.00
* Juki 6000 Daisy Wheel Serial	£	179.00
* Juki 6100 Daisy Wheel	£	299.00
* Juki 6100 Sheet Feeder	£	159.00
* Juki 6200 Daisy Wheel Parallel	£	429.00
* Juki 6300 Daisy Wheel Parallel	£	699.00
* Juki 6300 Daisy Wheel Serial	£	699.00
* Juki 6500 Daisy Wheel Par/Ser	£	899.00
* Micro P MP26 Daisy Wheel	£	239.00
* Micro P MP40 Daisy Wheel	£	299.00
* Panasonic P3131 Daisy Wheel	£	299.00
* Panasonic P3151 Daisy Wheel	£	499.00

PANASONIC PRINTERS

* Panasonic 1081 120cps 28cps NLQ	£	147.00
* Panasonic 1082 160cps 35cps NLQ	£	179.00
* Panasonic 1083 240cps 48cps NLQ	£	299.00
* Panasonic 1592 136col 180cps	£	359.00
* Panasonic 1595 136col 240cps	£	429.00
* Panasonic KXP1540 24pin 240cps	£	599.00

DISKS 5¼ & 3½

* Box of 10 5.25 Disks With Library Case DS/DD 96tpi Hub Ring	£	9.95
* Box of 10 3.5 Disks With Library Case DS/DD 135tpi	£	15.95

CALL FOR ALL ACORN MAJOR SPARES WE CARRY MANY OTHER ITEMS IN STOCK

PRINTER RIBBONS

* FX80/85 MP165	£	4.95
* LX80/86	£	4.50
* LX800	£	7.95
* Canon Kaga	£	5.95
* Epson FX100/RX100	£	7.95
* Epson FX105	£	9.95
* Epson LQ800	£	11.95
* Epson LQ1000	£	11.95
* Epson FX1000	£	7.95
* Juki 6100	£	6.95
* Panasonic 1081	£	6.95
* Epson EX800 Colour	£	16.00
* Epson EX1000 Colour	£	16.00
* CPA-80 Ribbon	£	3.95

PEARTREE PRODUCTS

* MR5000 Master ROM Cartridge Allows 2 ROMS To Be Fitted	£	8.95
* MR6000 Master ROM Cartridge Allows 4 ROMS To Be Fitted	£	11.95
* MR7200 Master RAM Cartridge 32k W/P Sideways Cartridge	£	33.95
* MR8000 Master RAM Cartridge 64k Battery Backed S/Ways RAM	£	49.95
* MR3000 Mini ROM Board BBC B Only Extension of 4 ROMS in the BBC	£	15.95
* MR4300 Mini ROM/RAM Board BBC B 32k S/Ways + 3 ROM Sockets	£	39.95
* MR4800 Mini RAM Board BBC B Only 128k Battery Backed S/Ways	£	89.95

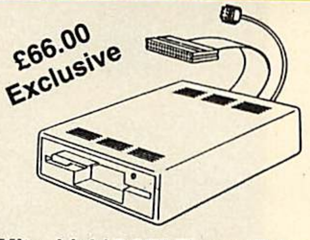
LEADS & PRINTER CABLES

* BBC to TV Lead	£	1.25
* BBC to Green Monitor Lead	£	2.95
* BBC to Sony/Kaga Colour Lead	£	5.95
* BBC to Microvitec Lead	£	2.25
* Phono to Phono Lead	£	1.25
* BNC to BNC Lead	£	2.95
* BBC to Cassette Lead	£	2.25
* BBC to Acorn Cassette Lead	£	2.25
* BBC to Centronics Lead	£	9.95
* BBC to Serial Printer Lead	£	9.95
* 4 Way Main AC Trailing Lead	£	9.50
* BBC Pace Modem Lead	£	4.95
* Master Compact Printer Lead	£	15.95
* Centronics to Centronics Lead	£	14.95
* BBC to Philips Col Monitor Lead	£	4.95
* BBC RGB Hantarex Lead	£	9.95

COMPONENTS SPARES ROMS & RAMS

* EPROMS 27128 16k EPROMS	£	5.25
* EPROMS 27256 32k EPROMS	£	5.25
* EPROMS 27512 64k EPROMS	£	10.50
** Intel 8271 FDC	£	49.00
** Intel 8271 FDC + Complete Kit	£	59.00
D-RAMS		
* 4164-15	£	2.75
* 4164-12	£	3.00
* 41256-15	£	8.75
* 41256-12	£	9.75
* 6264LP-8k Static RAM	£	8.75
* 65256LP-32k Static RAM	£	11.75
** 6502 Range		
* 6502A	£	4.95
* 65C02	£	9.50
* 65C12	£	9.00
* 6512A	£	9.95
* 6522A	£	4.50

THIS MONTH'S SUPER DEAL



Mitsubishi 5.25" Floppy Drive
40 Track Double Sided 200K Drive. Ready to plug into your BBC, BBC+ and The Master 128 Computer.

At a Special Price A Super Deal and a Super Value for only **£66.00** plus Courier Delivery, plus VAT

****** £83.95 ******
All Inclusive to Your Doorstep

IBM COMPATIBLE ADD-ON CARDS

* Mini Floppy Disk Drive Card For 2 Internal & 2 External For PC/XT Compatible	£ 39.00
* Floppy Disk Drive Adapter Card Drives 360K and 1.2 MBytes FDD + Cables PC/XT	£ 59.00
* Floppy Hard Disk Adapter Card PC AT Compatible Allowing up to 2FDD + 2HDD Complete with cables	£149.00
* Mono Graphic/Printer Card PC AT/XT Fully Hercules Compatible 720 x 348 Res.	£ 69.00
* Colour Graphic/Printer Card IBM CGA Compatible PC/XT TTL Composite Video Output 640 x 200 with 2 Colours 320 x 200 with 4 Colours	£ 58.00
* Enhanced Graphics Adapter Card Fully IBM, EGA, CGA, Hercules + MDA Compatible PC XT/AT 8 Display Modes 640 x 350 Res. 256K D/Mem	£189.00
* RAM CARDS Unpopulated PC/AT	
128K RAM CARD	£ 79.00
576K RAM CARD	£ 79.00
2 MByte RAM CARD XT	£109.00
2 MByte RAM CARD AT	£159.00
2.5 MByte RAM CARD PC/AT	£ 89.00
* Multi I/O/Video/FDC Card PC XT Compatible TTL, CGA RS232 Clock Calander Parallel Printer Port 2 x FDC Light Pen Interface 16K Screen Buffer	£129.00
* RS232 Interface Card PC XT	£ 29.00
1 RS232 Port Option for 2 Port	£ 42.00
* IEEE Standard 448 1978 Card PC XT/AT Compatible Fully GPIB Compatible Complete With Manual Testing Cable + Connector	£169.00

MUSIC 500

SPECIAL REDUCED PRICE £29.95

only from PEARTREE DRAM LTD

You may purchase any of the items listed, by cheque made payable to: **PEARTREE DRAM LTD.**
All you have to do is list your requirements on a sheet of paper, post it to us quoting ref, and we will despatch your goods within 7 days, whenever possible.
Please add the following amounts for postage and packing:

Items below **£10.00**	add **£1.50**
Items below **£50.00**	add **£2.50**
Items below **£100.00**	add **£3.50**
Items above **£100.00**	add **£10.00**

Independent courier for items over £100.00
All prices exclude VAT.
Visa, Access, Barclaycard, Mastercharge card holders – call us on our new special line:
(0480) 50595

Prices are correct at time of going to press. Peartree Dram reserves the right to change prices without prior notice.

All prices are exclusive of VAT

Registered in England · Registered No. 2256150 · 6 Rother Street, Stratford-Upon-Avon

PUTTING · THE · FUTURE · INTO · YOUR · HANDS





The Hardware

Scan-Light consists of a half-width expansion board (that will fit into any Archimedes), with on board ROM software and a choice of scanners. The hand-held scanner is able to scan or digitise pictures, text, signatures, diagrams from loose pages and books at 200 dots per inch. The full width version can scan complete A4 pages of information while the half-width scanner is restricted to a scan width of 105mm (just over 4 inches).

Both scanners have a brightness control and two different scan modes—normal monochrome mode suitable for line graphics or text, and a dithered mode suitable for photographs or half tone pictures.

Scanning a document is simple, the scanner is placed at the top of the page, the scan button is held down and the scanner dragged down the page. As it moves over the document the scanned image is shown on screen and captured in the computer's memory.

The Software

All the necessary scanner controlling software is included on a ROM as part of the interface board—it does not require programs to be loaded from disc.

The software is WIMP based and completely RISCOS compatible. This ensures it is both easy to use (all its features are controlled by menu options) and that it can multi-task with other RISCOS applications and run under the RISCOS desktop. (It is also completely compatible with the older Arthur operating system). Software features include:

- A full page preview is displayed, as the image is scanned, showing the digitised image as the scan progresses down the page.
- Once scanned the image is shown full size within a re-sizeable, scrollable window. The image may be magnified or reduced by any amount from 1% to 999% of original size.
- Pixel editing facilities allow individual pixels to be drawn or "undrawn".
- A variety of printer drivers is included to transfer the image to a range of dot matrix, inkjet and laser printers.
- A special grey-scale preview mode anti-aliases the scanned image to produce a true grey-level picture, allowing near photographic quality images to be obtained.
- Scanned images, or any selected part, may be saved in a variety of ways:
  (i) As a compressed data file (saves disc space).
  (ii) As a monochrome sprite.
  (iii) As a 16 grey-level anti-aliased sprite.

The latter option is ideal for incorporating pictures or photographs into other programs such as Paint and Draw or any DTP program such as the Acorn DTP or Impression programs.

MULTIPLE INPUT/OUTPUT PODULE FOR THE ARCHIMEDES

FED UP WITH BUYING SEPARATE PODULES?
Using surface mounted components and ultra-miniature technologies, a complete I/O system for the Archimedes has been created to fit into a half-height Eurocard.

It includes the following features:

VIDEO DIGITISER
Video digitiser for use with stationary picture sources (2 second scan in MODE 12 and MODE 15. Ideal for video recorders and cameras. This digitises to 256 levels of grey, colour is provided by an optional breakout box.



A MODE 12 picture

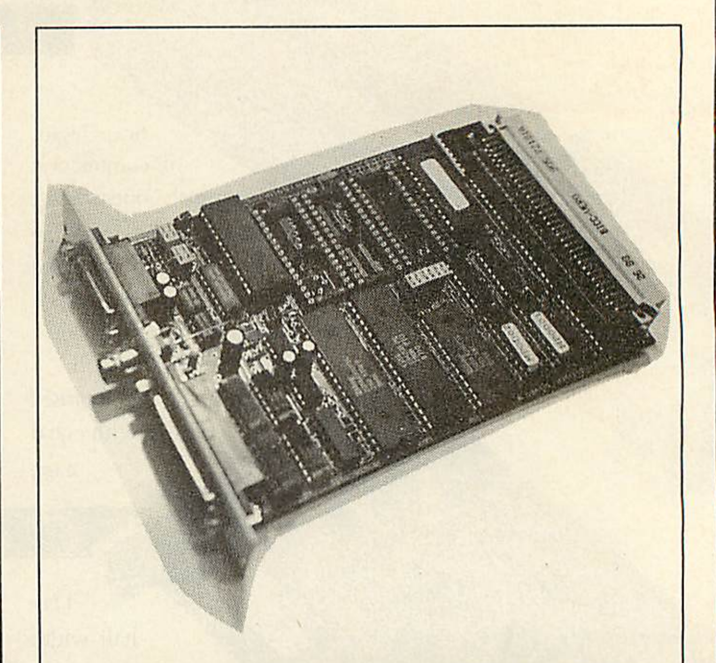
SOUND DIGITISER
A good quality stereo sound sampler with 8 bit resolution.

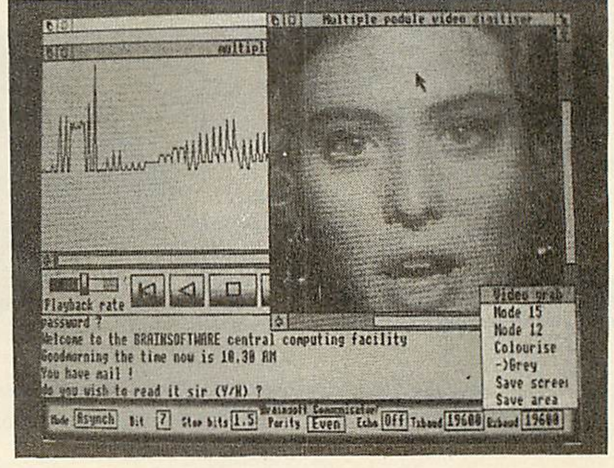
RS232 INTERFACE
A full RS232 interface is provided with all modem control lines, onto a standard 25 way D connector. +/− 10 V levels are used to drive the RS232 lines.

JOYSTICK INTERFACE
A single Dual channel joystick can be inserted and used with the standard 15 way D connector.

ROM SOCKETS
Rom sockets are provided which can accept up to 3 roms, each of which can be up to 128k in size. Software provides for a complete ROM filing system.

Software for the above features is provided on the board, and a desktop (wimp) environment is provided on disk.
Price £117 + VAT, (from 18th June).





NEW DESKTOP ENVIRONMENT

★ ★

RGB TO COMPOSITE ENCODER
A product designed to interface the Archimedes RGB output to composite monitors and video recorders.
Price £45 + VAT.

4-SLOT BALANCED ADVANCED TECHNOLOGY BACKPLANE
Computer optimised and designed for ultra-reliable operation with podules designed to Acorn specifications.
Price £55 + VAT.
Fan + VAT.

The Multiple Input/Output Podule is available from Technomatic and local dealers.
Due to the high demand for these products we can not accept credit orders, business is on a first-come first-served basis. Payment is by cheque, P.O. or cash. Please add £3 postage and VAT to all the above prices.

BRAINSOFT LTD
106 Baker Street, London W1M 1DF
Telephone: 01-486 0321
Fax: 01-486 2111



TECHNOMATIC

Techno House 468 Church Lane, London NW9 8TQ.
Tel: 01-205 9558 Fax: 01-205 0190

Archimedes, Computer Systems

All Archimedes systems are fitted with new RISC OS systems.

310 Base System	**£899**
310 Colour System	**£1099**
410/1 Base System	**£1199**
410/1 Colour System	**£1399**
420/1 Base System	**£1699**
420/1 Colour System	**£1899**
440 Base System (20Mb)	**£2250**
440 + Colour System	**£2450**
PC Emulator*	**£60**

*(This price applies when purchased with the computer)

carriage £12/system £8/computer

For the colour system we offer a choice between Acorn Colour Monitor (Philips CM8533) and Philips CM8833 with RGB/RGB1 and Comp Video input and stereo sound facility.
Every 440 System will be supplied with Acorn Developers Toolbox and a PC Emulator or first Word Plus at no extra cost.

Technomatic Special Deal

To get you going on any of the above Archimedes systems you purchase from us, we will contribute 10% of its cost towards any additional hardware or software purchase you make from us.

The following MultiScan Monitors can be supplied at special prices when purchased with a computer:

TAXAN 770+ **£429(a)**
MTS9600 **£375(a)** CM1686 16" **£1499(a)**
(for the extra HIRes modes on 400 series)

EXPANSION SYSTEMS

RISCOS (enquire for delivery)	£29(b)
Fitting	£10
0.5Mb RAM upgrade (305)	£139(c)
RAM upgrade (410/420)/Mb	£179(c)
Hard Drive upgrade (410/420)	POA
2nd Floppy Drive (305-310)	£118(b)
20Mb Hard disc + Card (305-310)	£469(b)
Acorn Backplane (2 slots)	£37(c)
TechnoLog Backplane (4 slots)	£39(c)
Fan for AW/TechnoLog Backplane	£10(d)
I/O Podule	£80(c)
Acorn ROM Expansion Card	£55(c)
CC Rom Expansion Card	£45(c)
Econet Network Module	£49(d)
MIDI Expansion Card	£66(c)
MIDI Add-on to I/O	£37(d)
IEEE Interface Card	£283(b)
16bit Parallel I/O Card	£195(b)
Dual RS232 Card	£195(b)
WildVision Chromalock Board	£280(b)
AtomWide Prototyping Board	£35(d)
ARC/BBC Serial Link	£15 (d)
ARC External drive Adaptor	£30(d)
ARC External 5.25" Drive	£90(b)
Arc Printer Lead	£7(d)
Arc Keyboard Extn Lead	£7(d)
Arc Scart Lead	£7(d)
Arc Dust Cover	£8.50(d)
High Quality Mouse Mat	£4(d)

Archimedes SOFTWARE

LANGUAGES & PROG. TOOLS

ANSI C/ISO PASCAL/ FORTRAN 77	each £95(c)
PROLOG X/LISP	each £175(b)
TWIN Editor	£27(d)
Archimedes Assembler	£185(b)
Software Dev. Toolbox	£185(b)
RISC BASIC Compiler (SV)	£85(c)
Clares Toolkit £32(d) Clares Toolkit+	£41(d)

WORD PROCESSORS

First Word Plus	£79(c)
GraphicsWriter	£27(d)
Pipedream	£89(c)
Pipedream Spellchecker	£43(d)

SPREADSHEETS

Logistix £95(c) Sigmasheet	£57(c)

ACCOUNTING SYSTEM

Minerva's Suite*	each £54(d)

(Order Processing/Sales Ledger/Stock Manager/ Purch. Ledger/Nom. Ledger)
Requires System Delta plus

Home Accounts	£41(d)

EMULATED PACKAGES

VIEW/Viewsheet/Viewstore	each £47(d)
Interword/Intersheet	each £35(d)
Wordwise	£20(d)

GRAPHICS/ART/CAD

ProArtisan £137(b) Artisan	£30(d)
Artisan Support Disc	£17(d)
Auto Sketch	£69(d)
Gamma Plot	£57(d)
Render Bender	£65(d)
Presenter £24(d) SVARC-PCB	£167(b)
SVSolidCAD £41(d) SVSuperDump	£20(d)
SV Real Time Solids Modeller	£75(c)

GAMES

Hoverbod/Missile Control	each £12(d)
Orion/Freddie's Folly	each £12(d)
Zarch £15(d) Conqueror	£24(d)
Enthar Seven £29(d) Minotaur	£9(d)
Clares 3 Game Pack	£12(d)
Thundermonk £12(d) Corruption	£20(d)
Pacmaria £16(d) Terramex	£16(d)

DATABASES

System Delta Plus	£57(c)
System Delta Plus Prog Ref Manual	£25(d)
Reporter*	£33(d)
Mailshot*	£33(d)
School Administrator	£125(b)
Alphabase	£37(d)

**Requires System Delta plus*

MISCELLANEOUS

PC Emulator	£79(d)
HEARSAY Comms Package	£55(d)
MAYA Terminal Emulator	£49(d)
Control (setup utility)	£13(d)

Ex-SERVICE EQUIPMENT

Our Service department has a number of disc drives, monitors and printers available for sale at reduced prices. Please send for detailed list.

MASTER SERIES

AMB15 Master 128	**£439(a)**

The Master package includes: ***View Word processor and Viewsheet spreadsheet*** **software and EITHER** ***Educational/Fun software*** **bundle with** ***STARdataBASE package*** **OR A** ***200K 40T DS single drive TS200.*** **Please specify your choice.**

ADC06 Turbo 65C102 Module	**£115(b)**
ADF10 Econet Module £49(c) Acorn Rom Cartridge	£13(d)
ADJ22 Ref Manual I £14(c) ADJ23 Ref Manual II	£14(c)
TRC32 32K RAM Cart. £15(d) Master Dust Cover	£4.75(d)
Universal CoProc Adapter	£49(b)
BBC Domesday System	£2,500(2×a)

ECONET ACCESSORIES

Stacking Filestore E01S	£999(d)
Filestore Hard Disc E40S	£899(a)
Filestore Hard Disc E60S	£1199(a)
Econet Starter Kit £85(b) Econet Bridge	£174(b)
Econet Socket Set £29(c) Printer Server Rom	£41(d)
File Server Level II £75(b) 10 Station Lead Set	£34(d)
Master FS Utility Disc	£17.25(d)

Multi I/O System for Arc

A multi I/O card utilising ultra-miniature technology provides five different facilities on a half euro card at *budget price:*

Video Digitiser digitises stationary picture sources (2 sec scan in modes 12&15) to 256 levels of grey. Ideal for use with video recorders and cameras.

Sound Digitiser: a highly quality stereo sound sampler with 8 bit res and four-fold over sample setting. Optional breakout box available for colour.

A full RS232 interface with all modem control lines. +10V levels are used for driving the RS232 lines.

3 ROM sockets for all ROMs upto 128K (32 pins) and software for ROM and RAM filing systems.

Joystick interface provides a dual channel joystick connector through a 15 way D connector.

Software for all facilities listed plus full range of SWI and star command included in firmware on board. Optional breakout box to provide colour on digitised pictures to be available soon.

Multi I/O board for only £107(b)

SPECIAL DISCOUNTS

We can provide attractive discounts to **Education Authorities, Schools, Colleges and Health Authorities.** Simply phone us or write, outlining your requirements, and we will supply a quotation.

Extended Finance

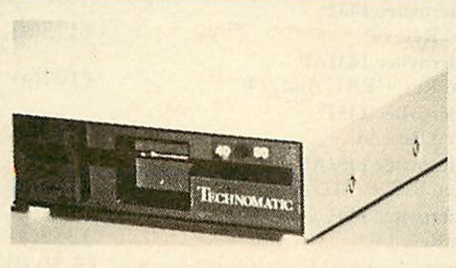
We can offer extended finance at competitive rates. If you are interested please ask for details.
Technomatic is a licensed credit broker

All prices ex VAT and subject to change without notice. See page 6 for Carriage Charges.

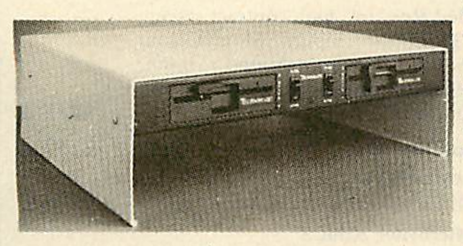
TECHNOMATIC

Techno House 468 Church Lane, London NW9 8TQ. Tel: 01-205 9558 Fax: 01-205 0190

TECHNOMATIC DISC DRIVES



TS 400



PD 800P

A range of high quality high performance drives to meet the needs of all BBC Micro Users.

*All drives are fitted with high quality slim line ultra low power mechanisms capable of single and double density operation and offering fast track access and head setting times.

*5.25" floppy drives are fitted with 40/80 track switches as standard at no extra cost. The switches are located in the front and clearly marked to indicate the status at a glance.

*The mechanisms are set inside attractively styled, sturdy metal casings painted in BBC beige colour.

*All drives fitted with all necessary leads and are ready for operation on unpacking. The drives with the mains power supply are supplied with a mains lead fitted with a suitably fused 13A moulded plug.

* TECHNOMATIC drives stand out from other drives because of elegance in design, high quality of construction and use of reliable switch mode power supply units (on dual drives).

*Our plinth drives have been thoughtfully designed and provide a choice of two 5.25" drives or a combination of 5.25" and 3.5" drives. The plinth drives are designed to give a professional look to the system installation and at the same time provide considerable space saving. Their rugged construction ensures that there is no sagging under the weight of even a 20" monitor.

5.25" Single Drives 40/80 switchable:

TS400 400K/640K	**£80(b)**
PS400 400K/640K with integral mains power supply	**£90(b)**

5.25" Dual Drives 40/80 switchable:

TD800 800K/1280K	**£160(a)**
PD800 800K/1280K with integral mains power supply	**£170(a)**
PD800P 800K/1280K with integral mainspower supply and monitor stand	**£185(a)**
PD800 Case with psu & data cable	**£42(b)**
PD800P Case with psu & data cable	**£75(a)**

PS400/PS351 are Compact/Archimedes compatible.
PD800/PD352/PD853 are Archimedes compatible.

3.5" 80T DS Drives:

TS351 single 400K/640K	**£69(b)**
PS351 3.5" single drive with integral mains power supply in a 5.25" case.	**£95(b)**
TD352 Dual 800K/1280K	**£126(a)**
PD352 3.5" dual drive with integral mains power supply in a 5.25" case.	**£139(a)**

Combo Drives (5.25" & 3.5" drives)

PD853 with integral psu	**£180(a)**
PD853P with integral psu	**£205(a)**

(Combo drives in plinth mounting).

DISC DRIVE MULTIPLEXER
For Master, B, B+ and any DFS/ADFS

TDM2 Two computers/one drive unit	**£65(b)**
TDM4 Four computers/one drive unit	**£115(b)**

SPECIAL OFFER

TS200 40T DS
only £65(b)
(offer valid whilst stock last)

A E D A. ARCHIMEDES EXTERNAL DRIVE ADAPTOR

Technomatic's AEDA provides a reliable external disc drive adaptor with a variety of novel features.

★ It is designed for easy and neat installation and takes only a few minutes to instal. Rear fixing plate is supplied in two halves so as not to interfere with existing expansion boards or those likely to be installed in future.

★ It is fully buffered and allows up to three external drives (3.5" or 5.25") to be connected.

★ Externally located toggle switch allows selecting either internal or external drive as drive 0 or drive A. This feature is particularly useful when booting up from the external drive is required.

★ AEDA is supplied configured for one internal and up to three external drives. On board options allows for reconfiguration to two internal and two external drives.

★ Other on board options allow setting 'disc eject' from the keyboard if the drive is capable of this facility.

Technomatic AEDA	**£30(c)**

MASTER COMPACT ADD-ONS

128K RAM, 640K 3.5" DS Drive + Educ software and our bundled Educ/Fun package included

Entry System	**£310(a)**
with 12" Mono Monitor	**£375(2×a)**
with 14" Col Monitor	**£475(2×a)**

2nd Drive Kit	**£90(c)**	Serial Kit	**£25(d)**
Mertec Adaptor	**£35(c)**	TV Modulator	**£26(d)**
Ext Drive Adaptor	**£9(d)**	Printer Lead	**£7(d)**

WINCHESTER DRIVES

Most popular range of Winchesters for BBC at competitive prices.

Single Winchesters, housed in attractively styled metal enclosures in BBC matching beige colour are fan cooled and powered by switch mode power supply for quiet, efficient and reliable operation.

Winchester/floppy combination drives, housed in our elegant plinth housing.

To get the most from the Winchester, the following utilities are installed on the drives:

★ TREE PLAN: A utility to create an organised directory structure and display it on the screen or dump it to a printer.
★ Formatter and verify program.
★ For Master users our popular front end utility to display the entire contents of the drive in icon format. Files can be loaded simply by pointing at the icons.

P30HD 30Mb Winchester	**£410(a)**
P304HP* 30Mb Winchester + 640K DS 40/80T floppy	**£609(a)**

*(mounted in plinth type casing)

Larger drives available on request.

UPGRADE KITS

1.20S ROM	£15(d)	ADFS ROM	£26(d)
DNFS ROM	£19(d)	1770 DFS Kit	£49(d)
BASIC II ROM	£22.50(d)	Econet Kit	£55(d)

RAM/ROM EXPANSION

ATPL Board for Model B. Simple to instal, no soldering. Allows expansion to 15 Roms + 2*8K RAMS	**£37(c)**
ATPL Battery backup kit	**£18(d)**
ATPL Board for BBC+ (10 Roms)	**£31(c)**

3M FLOPPY DISCS

5.25" Discs in packs of 10

744 40T SS DD	**£6.50(d)**
745 40T DS DD	**£7.00(d)**
746 80T SS DD	**£12.00(d)**
747 80T DS DD	**£11.00(d)**

(Add £1 for library case packing)

3.5" Discs in packs of 10

80T SS DD	**£10.00(d)**
80T DS DD	**£11.75(d)**

Voucher for free Quartz wrist watch with every purchase of 5 packs of 3M discs whilst stocks last.

BULK DISCS

50 5.25" 40 T single sided discs with sleeves in lockable box.	**£20(b)**
50 5.25" 80 T double sided discs with sleeves in lockable box.	**£25(b)**
40 3.5" 80T DS Discs in lockable box	**£38(b)**

FLOPPICLENE DRIVE HEAD CLEANING KIT

5.25" Kit with 20 disposable discs	**£14.00(d)**
3.5" Kit with 20 disposable discs	**£14.75(d)**
Conventional DriveHead Cleaning Kit (pse specify 3.5" or 5.25")	**£4(d)**

DISC STORAGE BOXES

DB340 Lockable 40 × 3.5"	**£6(c)**
DB380 Lockable 80 × 3.5"	**£7(b)**
DB550 Lockable 50 × 5.25"	**£6(c)**
DB100 Lockable 100 × 5.25"	**£7(b)**

EPROMS/RAMS

2764-25	**£2.80**	27256-25	**£6**
27128-25 (12.5vVpp)	**£4.50**	27128-25 (21vVpp)	**£6**
27512-25	**£9**	6264LP-15	**£6**

These prices subject to change (Carriage code d)

All prices ex VAT and subject to change without notice. See page 6 for Carriage Charges.

TECHNOMATIC

Techno House 468 Church Lane, London NW9 8TQ. Tel: 01-205 9558 Fax: 01-205 0190

BBC FIRM/SOFTWARE

INTEGRATED PACKAGES

MEGA 3 ROM	£76(c)
Three ROMS in one Interword/Intersheet/Interchart	
MINI OFFICE	
The most economical package you can buy.	
Disc for Model B & B+	£14(d)
Disc for Master	£16(d)
Disc for Compact	£19(d)
(please specify 40 or 80T Disc)	
ROM Version (B,B+, M&C)	£43(c)

WORD PROCESSORS

Acorn View Professional	£50(c)
VIEW 2.1	£35(d)
VIEW 3.0	£45(c)
Double View Disc	£15(d)
View Printer Driver	£9(d)
WORDWISE	£24(d)
WORDWISE PLUS	£38(d)
INTERWORD	£36(d)
SPELLMASTER	£42(d)
EDWORD II	£39(c)
WYSIWYG PLUS	£15(d)
(What You See Is What You Get)	
A screen and printer utility ROM	

DATABASE SYSTEMS

Viewstore	£36(d)
Overview (for Master or Compact)	£65(b)
InterBase	£49(d)
STARdataBASE	£29(d)

SPREADSHEETS

Viewsheet	£36(d)
Windomatic	£15(d)
(utility to release the power of Viewsheet)	
Intersheet	£37(d)
Interchart	£25(d)

LANGUAGES

Acornsoft C	£29(d)
Acorn MicroProlog	£49(d)
ISO PASCAL	£51(c)
ISO PASCAL SAG	£30(d)
Oxford Pascal (B,B+)	£32(d)
Oxford Pascal (M)	£32(d)
Logotron Logo	£49(c)

NOVACAD (B,B+,M)

NOVACAD T/M Version	£39(d)
NOVACAD + Plotter DG	£49(d)
Plotter Driver Generator	£12(d)
TechnoCAD	£99(c)

MARCONI TRACKER BALL

RB2 Stand Alone	£49(c)
(Specify if AMX compatibility reqd)	
RB2 with Pointer Rom (M)	£59(c)
RB2 with Icon Master (B,B+)	£59(c)

UNIVERSAL DEVELOPMENT SYSTEM

A set of three packages to meet the needs of any software developer for assembling, disassembling and emulating codes for over 30 processors. Packages are structured to work with new processors.

META Assembler	£90(b)
META Disassembler	£90(b)

COMMUNICATIONS

Termulator (B, B+)	£25(d)
Termulator (M,C)	£35(d)
MAYA Terminal Emulator	£49(d)
(Disc with ROM Image (B,B+, M,C,A)	
MAYA Terminal Em. ROM	£7(d)

PRINTER UTILITIES

Dumpmaster ROM	£26(d)
(screen dump utility for a variety of printers incl colour printers)	
Screen Print	£25(d)
(a powerful printer dump utility)	
Printmaster	£24(d)
(Versatile utility for Epson printers)	
WYSIWYG plus	£15(d)
Printer drive for any printer, compatible with View, WW, Interword. On Screen display of the actual typestyles/fonts chosen.	

UPGRADES

ADFS ROM	£26(d)
1770 DFS Kit	£49(c)
DNFS ROM	£17(d)
1770 DFS ROM	£15(d)
1.2 OS ROM	£15(d)
BASIC II ROM	£22.50(d)

TIME WARP for Models B & B+

Upgrade your model B or B+ computer to provide real time and date information at any time. Time Warp with battery back up fitted as standard simply plugs into the User Port. Demo Software on Disc includes a diary/planner application. **£29(d)**

SPARE PARTS

BBC B/B+ Power Supply	£52(b)
BBC B keyboard	£52(b)
BBC B Keyboard Connector	£4.75(d)
BBC B/B+ Video ULA	£18(d)
BBC B/B+ Serial ULA	£12(d)
KeySwitch B,B+, M	£1.75(d)
(pse specify original type)	
UHF Modulator	£4(d)
16Mhz Xtal	£2.50(d)
17.734 MHz Xtal	£2.50(d)
6502A	£5.50(d)
4816 RAM (B)	£2(d)
Master psu	£59(b)
Master Keyboard	£62(b)
Keyboard Connector set (M)	£5(d)
1Mb OS ROM M	£39(d)
CF30060 ULA (M)	£10(d)
CF30047 ULA	£15(d)
ULA (512)	£34(d)
ULA (6502 & Z80 2nd Proc)	£28(d)
Power Supply (2nd Proc)	£42(b)
ARC Keyboard Assy	£85(b)
Arc Power Supply	£65(b)
Mouse	£49(c)
Drive Cable	£5(d)
Keyboard Curly Cable	£22(c)
Window Moulding	£6(d)
41464	£8(d)

If the parts you need are not listed above please call us)

MISCELLANEOUS

Single Drive Case (no psu)	£10(d)
Dual Drive Case (inc cable/psu)	£42(b)
Plinth Case (inc cable/psu)	£75(d)
Drive Data Cable Single £5(d) Dual	£6(d)
Drive Power Cable Single £3(d) Dual	£4(d)
Econet Cable 5pin DIN/5 pin DIN	£3(d)
ROM Extraction Tool	£2(d)

EPROM ERASER

UVI Eraser: Compact eraser in smart case, can erase six eprom at a time. Safety cut out switch ensures no exposure to UV rays when the carrier tray is drawn out. **£47(c)**

UV1T Easer: As above but with a built-in timer so that you do not have to worry about over exposure and damaging the eproms. **£59(c)**

BBC PUBLICATIONS EDUCATIONAL SOFTWARE

PRIMARY EDUCATION

Astronomy	£8(d)
Computers At Work Aud/Disc	£16(c)
Picture Craft	£17(d)
Introducing Geography	£15(d)
The Hall of Mirrors	£13(d)
Geordie Racer	£12(d)
Bird Spy	£8(d)
Maths Aud/Disc	£12(d)

SECONDARY LEARNING

Technology & Design Pt 1	£21.50(c)
Electric Fields	£8(d)
'A' Level Statistics	£19(d)
'A' Level Geography	£13(d)
Inside Information Prog/Cass	£10(d)
Book £8(d) Aud	£5(d)
Open Learning Pack D/Aud/Bk	£36(b)
Science Topic (ST): WAVES	£7(d)
ST: RELATIONSHIPS	£7(d)
ST: BONDING	£7(d)
ST: ElecMag. Spectrum	£7(d)
ST: Electronic in Action	£7(d)
ST: Newton & The Shuttle	£9(d)
ST: ECOLOGY	£9(d)
ST: POLYMERS	£9(d)
ST: Classif. & Periodic Tab	£10(d)
ST: Food & Population	£10(d)
Sec Science (SS) Microtech	£7(d)
SS: Mole Concept Disc/Aud	£10(d)

GENERAL

Vu-Type	£7.50(d)
Vu-Type Professional	£19(d)
White Knight Mk II	£16(d)
(pse specify Compact or 1770DFS)	
Battlefields Cass	£5(d)
Espana Viva Disc	£19(d)
Book £6.95(d) Disc/Aud (2)	£7(d)
Black Queen (1770DFS)	£13(d)
Bismark (1770DFS)	£13(d)

Codes: **Cass:** Program on Cassette. **Aud:** Audio Cassette. **Disc or no Code:** Program on disc
Above Programs are suitable for BBC B, B+ & Master

All software in this advertisement has been tested to work with appropriate Acorn Disc Filing Systems only and we are unable to comment on compatibility with any other filing system. It will be the buyers responsibility to verify such compatibility.

All prices ex VAT and subject to change without notice. See page 6 for Carriage Charges.

TECHNOMATIC

Techno House 468 Church Lane, London NW9 8TQ. Tel: 01-205 9558 Fax: 01-205 0190



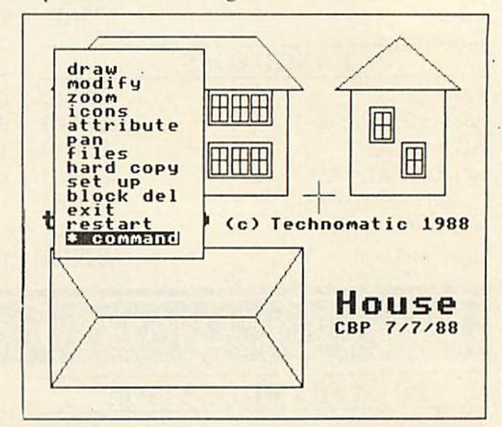
- ★ An easy to use CAD system with pop up menus providing a user friendly interface at all stages of operation.
- ★ Input can be configured for keyboard, mouse or tracker ball. Only three keys to input all commands if input from keyboard.
- ★ Virtually no limit to the size or complexity of the drawing that can be created. Powerful zoom facility allows a A0 size drawing to be viewed from single screen or a single screen can be enlarged to A0 size. Continuous panning across a drawing by specifying co-ordinates.
- ★ Lines, arcs and circles can be drawn with ease and in user defined colour and thickness. These can be modified at any stage of drawing.
- ★ User definable grid and scale, together with on screen display of dimensions, and co-ordinates enable easy and accurate drawings.
- ★ Multi layering capability with 8 levels allows superimposition of drawings.
- ★ Powerful icon utility allows any shape or drawing to be saved to a library as an icon. Icons can be recalled from the library and placed anywhere on the screen drawing at required scale and orientation.
- ★ Toolkit program allows customisation of files, utilities and peripherals.
- ★ Drawings can be scaled on screen to suit the plotter or printer in use. A maximum resolution of 0.01mm is available. Pre-configured drivers for many popular plotters and a driver generator for any BBC compatible plotter is included. Printer drivers for Epson 9 pin and 24 pin printers are included as standard as is the facility for installing drivers for other printers. Printers will output in landscape or portrait format.

FREE EVALUATION DISC AVAILABLE
Phone for your copy
£99(c)

Why technoCAD

The best feature of technoCAD is not its outstanding performance, not its unique ability to allow creation of complex icons, not the quality of output from printers or plotters. The best feature is the unprecedented ease with which it can be mastered. With easy to use single key commands limited to three keys, pull down menus and a clear and concise, easy to read manual, technoCAD is truly the system any one can use.

technoCAD will meet the needs of most professional applications and is an ideal tool for teaching CAD in technical schools, CDT departments and colleges.



BOOKS

No VAT Carriage Code (c)

LANGUAGES

6502 Assy Lang Prog	£10
6502 Programming	£8
8086 Book	£23.95
Acorn FORTH	£8
Acorn LISP	£8
Acorn ISO Pascal Ref Manual	£8
BASIC ROM User Guide	£9.95
30Hr BASIC	£7.50
Intro to COMAL	£8
Master Reference Manual I	£14
Master Reference Manual II	£14
Micro Prolog Ref Manual	£8

BBC MICRO GUIDE BOOKS

Inside Information	£8.95
Maths Prog in BBC Basic	£5.95

ARCHIMEDES

Archimedes Reference Manual	£29.95
Arc. Assy. Lang. Prog.	£14.95
Inside Autosketch	£12
Operation Archie	£14.95

PROGRAMMING/UTILITY

Advanced Sideways Ram User Guide	£8
Advanced User Guide (BBC)	£15.95
New Advanced User Guide	£19.95
Assy. Lang. Prog. BBC	£10.50
Mastering Assembly Code	£6.00
Mastering Interpreters & Compilers	£10.00
Master Operating System	£6.95
Mastering View, Viewsheet & Viewstore	£8.00
View by B. Smith Dabhand	£8.00
View 3.0 Manual	£8.00
Viewstore Manual	£8.00
Viewsheet User Guide	£8.00
Wordwise Plus	£5.00
Understanding Interword	£5.00

SOUND & GRAPHICS

Computer Graphics & CAD Fundamentals	£5.00
Mastering Music	£5.00

DISC DRIVE SYSTEMS

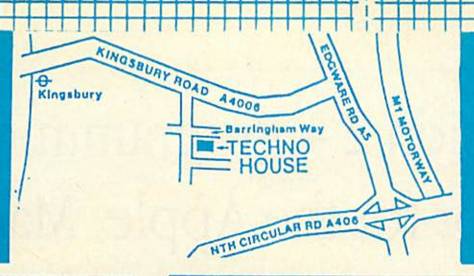
Advanced Disc User Guide	£15.00
Disc Programming Techniques	£7.00
File Handling on the BBC	£7.00
Practical Disc File Techniques	£4.00
Mastering the Disc Drive	£5.00
Mastering DOS plus	£9.00

APPLICATIONS

The Software Business	£2.50

TECHNOMATIC

MAIL ORDER & RETAIL
Techno House
468 Church Lane
London NW9 8TQ
Tel: 01-205 9558
Fax: 01-205 0190



For fast delivery telephone your order on 01-205 9558 using VISA/Access Card

Orders welcome from government depts, & educational establishments

All prices ex VAT
Prices are subject to change without notice
Please add carriage
(a) £8.00 (Courier)
(b) £3.50
(c) £1.50
(d) £1.00

BOOKS

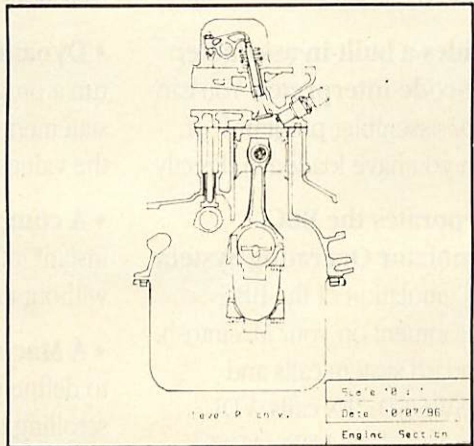
Title	Price
1-2-3 For Business	£20.95
1-2-3 Tips, Tricks & Traps 2nd	£19.95
80286/80287 Progs Ref Man	£17.00
8087 Applics. & Programming	£19.10
ABC of Wordperfect 5	£16.95
ABC's of 1-2-3	£16.95
ABC's of Autocad	£20.95
Advanced C Techniques & Applc	£19.95
Advanced MS DOS (Microsoft)	£22.95
Advanced Ventura	£21.95
C Programming Language 2 Ed	£24.95
C The Complete Reference	£21.95
dBASE IV Essentials	£14.80
dBASE IV Handbook 3rd Ed	£19.95
dBASE IV Quick Ref	£6.95
dBASE IV Tips, Tricks & Traps	£20.45
DOS Complete Reference	£21.95
DOS Power Tools	£39.95
DOS Programmers Reference	£22.95
Everymans Primer dBASE IV	£16.50
How to Run a Hard Disc PC	£18.45
Inside Autocad V 2.6 REL9	£32.45
Inside Autosketch	£13.95
Inside Xerox Ventura Publisher	£18.45
Lotus Agenda	£12.95
Managing your Hard Disc	£20.95
Mastering 1-2-3 2nd Ed	£19.95
Mastering Autocad 2nd Ed	£28.95
Mastering Framework II	£22.95
Mastering Symphony 4th Edition	£24.95
Mastering Ventura	£21.95
Mastering Wordperfect 5	£19.95
MS-DOS Encyclopedia to 3.2	£95.00
MS-DOS Users Guide 3rd Ed	£20.95
Networking IBM PC 2nd Ed	£18.45
PC Magazine DOS Power Tools	£39.95
Peter Norton's DOS Guide	£17.35
Postscript Language Ref. Man	£21.95
Power of Turbo Prolog	£12.00
Programmers Guide to Windows	£23.95
Publishing Power with Ventura	£25.95
RS232 Solutions	£18.95
Smart Tips, Trick & Traps	£22.45
Turbo G Complete Reference	£24.95
Turbo Pascal Complete Refer	£21.95
UNIX – The Book	£9.95
UNIX The Complete Reference	£22.95
Upgrading & Repairing PCs	£22.95
Using 1-2-3 Special Edition	£21.95
Using Excel	£19.95
Using Multimate Advant 2nd Ed	£18.45
Using Pagemaker on the IBM	£22.95
Using Quattro Prof Spreadsheet	£21.95
Using Sidekick Plus	£21.95
Using Smart	£21.45
Using Ventura Publisher	£22.95
Using Wordperfect 5	£19.95
Using Wordperfect W/Book & Disc	£27.45
Ventura Tips & Tricks	£19.95
Wordperfect Advanced Technqs.	£17.95
WordPerfect 5 Desk Companion	£22.95
Wordperfect Tips/Tricks/Traps	£19.95
dBASE III Plus H Book 2nd Ed	£20.95

We have many more books in stock. Please ask for details.
No VAT on books £2.50 P&P.

NOVACAD
Computer Aided Draughting System

Novacad can drive a plotter to produce drawings of highest quality... Novacad is excellent. It is flexible, genuinely easy to operate without much practice, and a pleasure to use. Beebug Dec 86

A sophisticated CAD package with unique facilities. Thousands of Novacad packages are being used in widely differing fields ranging from industries for producing engineering drawings to accountants offices for producing flow charts. Architects, engineers, plumbers, kitchen planners and many other professions requiring easy to use facilities for producing high quality output are making extensive use of Novacad's unique features. Novacad is proving to be an invaluable teaching aid in technical schools simply because of the ease with which it can be used.



Novacad is compatible with all models fitted with Acorn DFS. Hardware requirements can be minimum; single drive and FX80 compatible printer are enough to get started, though its performance is enhanced considerably by use of 6502 2nd processor, dual drive and to a degree with B+ and Master's shadow ram.

The major features offered are:

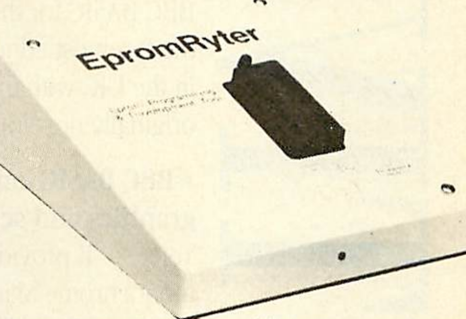
- ★ Simple and easy to use with logical command sequence.
- ★ A large drawing area (approx 15 screens)
- ★ Unique ability to create complex icons made up of upto 500 lines instead of the usual 15 to 20 pixels, store them in a library and recall them at different scales and orientations.
- ★ Zoom facility.
- ★ Create multi level drawings.
- ★ Text entry at any 90° orientation anywhere on the screen.
- ★ Grid scaling and locking, displacement measurements.
- ★ Printer routine for FX80/100 compatible printers
- ★ Cursor control from keyboard/tracker ball/mouse.

Plotter driver generator available as an optional utility, configures a routine for any BBC coompatible plotter. Pre configured routines for popular plotters like Epson HI80, Hitachi, Plotmate are included. Drawings can be scaled to maximumm plotter size.

NOVACAD T/M Version	£49(d)
NOVACAD T/M + Plotter DG	£61(c)
Plotter Driver Generator	£15(d)

EpromRyter

***Highly sophisticated & Advanced Programmer**
***All current single rail eproms handled**
***State of the Art Programming Algorithms**



EpromRyter is a powerful eprom programmer designed for use with the BBC Master Computer. It takes full advantage of the latest developments in the eprom technology and the extra facilities on the Master to provide fast, simple and efficient programming and editing facilities.

The software is totally menu driven and on screen help messages make the programming simple for both specialists and novices alike.

The EPROMRYTER interfaces with the Master through 1MHz bus. It is mains powered with its own psu. 3M Textool zif socket has been fitted to ensure consistent and reliable service over long periods.

The single rail eproms handled by the EpromRyter are:
- 2716 2732 2764 27128 27256 27512 27513 27011 2516 2532 2564 (NMOS & CMOS)
- One time eproms P27XXX, 87CXXX etc.
- Also A suffix eproms such as 27XXXA

£89(b) + VAT

EPROMER II

A proven Eprom programmer for BBC Model B and B+ with thousands in use in industry, educational and R&D establishments. It offers many of the powerful features of the EpromRyter and can program all single rail eproms upto 27256. Full details on request. **£89(b)**

This advertisement can only show an example of the range of products stocked by Technomatic. So send for our latest BBC catalogue providing detailed information and prices on BBC Computer Systems, Peripherals, Software and Books. To obtain your free copy please complete and return the coupon below.

Technomatic is an authorised BBC Computer and Econet Referral Centre providing a professional and reliable service to the BBC user.

NAME ....

ADDRESS ....

....

....................Post Code ....

6/89

Return to Technomatic Ltd, Techno House, 468 Church Lane, London NW9 8TQ.

All prices ex VAT and subject to change without notice. See page 6 for Carriage Charges





BBC BASIC Version 2 – Programming language and Emulator for the Apple™ Macintosh™

Combines the best of the BBC Microcomputer...

BBC BASIC for the Macintosh gives you access to the foremost educational programming language in the UK, with the ability to run many programs originally developed for the BBC Microcomputer.

• **BBC BASIC emulates BBC Microcomputer graphics and screen modes,** including Mode 7 Teletext. It provides grey shades on a monochrome Macintosh and colour on a Macintosh II, and you can even load BBC-format screen dumps directly to the screen.

• **BBC BASIC provides a built-in assembler and 6502 machine-code interpreter.** You can compile and run 6502 assembler programs, or machine code which you have loaded in directly.

• **BBC BASIC incorporates the BBC Microcomputer Emulator Operating System** – BEOS – to give full emulation of the BBC Microcomputer environment on your Macintosh, including all the standard system calls and vectors, OSBYTE, OSWORD, *FX calls, VDU codes, function keys, sound, and DFS/ADFS commands.

• **BBC BASIC includes the File»Mac transfer utility** which will transfer programs and data files between the BBC Microcomputer and Macintosh. Even !BOOT files can be transferred, and can then simply be double-clicked to run programs.

...with all the advantages of the Apple Macintosh:

BBC BASIC takes advantage of the advanced features of the Macintosh to provide a fast and powerful environment in which to develop, test, and run your BASIC programs.

• **A Macintosh-style interactive editor** provides a scrolling view of program listings with convenient cursor or mouse editing. You can work with any font available on your system and you can display keywords highlighted in bold for easy reference.

• **Dynamic tracing and debugging** lets you run a program, or step through, highlighting each statement as it is executed, and you can display the values of any variables or expressions.

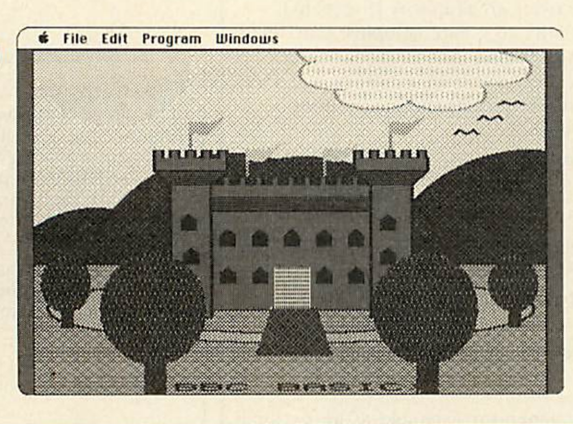
• **A comprehensive Help system** gives you instant information on keywords and operators, without interrupting what you are doing.

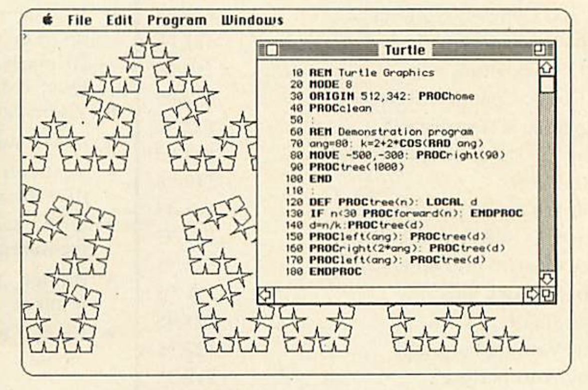
• **A Macintosh Toolbox interface** allows you to define your own menus, dialogue boxes, and scrolling lists using convenient BASIC keywords, and use the standard file dialogues for opening and saving data files.

The BBC BASIC package contains:

- One 800K disc containing BBC BASIC, File»Mac, and example programs
- BBC BASIC User Guide
- BEOS Reference Guide
- BBC BASIC Examples booklet







AU7/89

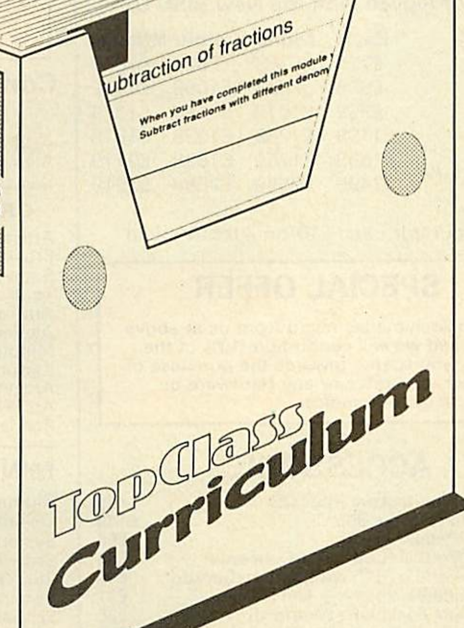
HUMAN▼COMPUTER INTERFACE · LIMITED

For more information:
Human-Computer Interface Limited
25 City Road, Cambridge, CB1 1DP, England.
Telephone: (0223) 314934 Fax: (0223) 462562

TopClass™ Curriculum



Computer assisted learning modules
For IBM PC/PS, compatibles, BBC, Nimbus



The complete GCSE Mathematics Curriculum....

....Covered in 9 packs

Teaching and Technology – hand in hand

Product summary & Order details

GCSE Mathematics Curriculum Product List

FCCM1	Foundation Level Maths Pack A
FCCM2	Foundation Level Maths Pack B
FCCM3	Foundation Level Maths Pack C
FCCM4	Intermediate Level Maths Pack A
FCCM5	Intermediate Level Maths Pack B
FCCM6	Intermediate Level Maths Pack C
FCCM7	Higher Level Maths Pack A
FCCM8	Higher Level Maths Pack B
FCCM9	Higher Level Maths Pack C

TopClass Curriculum versions available for the IBM PS/2 range, PC compatibles such as Amstrad PC, the BBC micro and the RM Nimbus

FCCTM	TopMark Courseware monitoring program

Available for IBM PC compatibles only

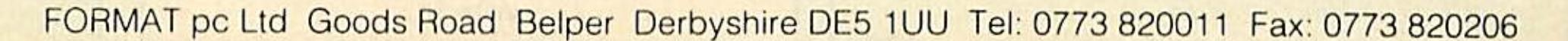
Specify computer make and model when ordering

• Other subjects available soon - Phone for details.

The complete GCSE course in modular form

- *Can be linked into other maths schema, for example School Mathematics Project*
- *Provides special benefits for special needs*
- *Meets the requirements of TVEI (E) and C.P.V.E.*
- *Also proven in FE, Vocational Education and Special Education*
- *Competence Based Learning – provides information for local and national profiling requirements*
- *Co-ordinates with the recommendations of the National Curriculum Council*
- *Technology assistance across the Curriculum*

Phone today for your sample module – 0773 820011

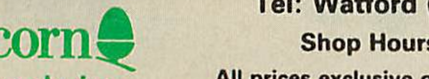


Format pc

FORMAT pc Ltd Goods Road Belper Derbyshire DE5 1UU Tel: 0773 820011 Fax: 0773 820206

Watford Electronics

Jessa House, 250 Lower High Street, Watford WD1 2AN, England
Tel: Watford (0923) 37774 Tlx: 8956095 Fax: 01 950 8989



The choice of Experience

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursdays 9am to 8pm

All prices exclusive of VAT; subject to change without notice & available on request.

Credit Card Orders (ACCESS & VISA) Tel (0923) 33383 or 50234 (24 Hours)



The choice before and after the experience



Now supplied with the New RISC OS

System	Basic	Mono	Colour	Multiscan
305	£725	£785	£924	£1869
310	£899	£859	£1098	£1318
310M	£959	£1019	£1158	£1379
410/1	£1199	£1259	£1398	£1619
420/1	£1699	£1759	£1898	£2119
440	£2499	£2559	£2698	£2919

(Securicor carr. £10 on Archimedes)

SPECIAL OFFER

Buy an Archimedes micro from us at above prices and we will conbtribute 10% of the money you spend, towards the purchase of a printer, disc drive or any Hardware or Software of your choice.

ACCESSORIES

- NEW Multitasking RISC OS £29
- 0.5 Mb RAM for 305 £139
- ROM Podule Acorn £56
- ROM Podule (Computer Concepts) £45
- ROM Podule (C C) with Battery Backup £59
- 2 Podule Backplane + Fan (Acorn) £37
- 2 Podule Backplane (Watford) £25
- 4 Podule Backplane (Watford) £38
- Backplane FAN only (for Hard Disc) £9
- 2nd 800K Floppy Drive (305/310) £118
- I/O Podule (with Analogue port, User port, & 1MHz bus) £80
- MIDI add-on to I/O Podule £37
- MIDI Expansion Card £65
- Sound Sampler (Armadillo) £129
- Chromalock Podule £280
- 20 Mb Hard Disc & Controller Card £469
- Watford's latest 20 Megabyte Hard Disc, Controller Card & Utilities Software £379
- Econet Network Board £49
- Archimedes IEEE Interface Adaptor £269
- Dual RS232 Podule £195
- 16 bit parallel I/O Card £195
- PC Emulation Pack incl. MSDOS 3.21 £65
- Archimedes Reference Manual £29
- Arm Assembly Lang. Prog. Manual £15
- Archimedes BBC Basic Guide £20

RISC OS Now available from stock

WORDPROCESSORS

Wordwise +	£18	Pipedream	£89
Image Writer	£25	P. Spellchecker	£40
Interword ROM	£35	View	£49
1st Word Plus	£75	Viewspell	£32
Archie Spell Master	£39	ViewIndex	£12

DATABASES

AlphaBase	£39	Flying Start II	£80
Viewstore	£49	System's Delta+	£60

SPREADSHEETS

Intersheet ROM	£35	Viewsheet	£49
Sigmasheet			£59

BUSINESS GRAPHICS

GammaPlot	£59	Interchart ROM	£25

INTEGRATED PACKAGES

Logistix – Database, Spreadsheet, Time Management & Business Graphics £94

By popular demand, we are now supplying refurbished and fully guaranteed BBC Micros with Disc Filing System

(Please telephone for price & availability)

Computer Concept's Software for Archimedes on Disc

A. Interword	£27	A. Spell-Master	£48
A. Interchart	£27	A. Intersheet	£27

GRAPHICS, ART, DESIGN & GAMES

Artisan	£31	Gamma Plus	£60
Pro Artisan	£140	Graphic Writer	£23
Support Disc	£16	Autosketch	£69
Toolkit (Beebug)	£32	Toolkit (Clares)	£31
Arc Termulator	£56	Zarch	£16
Alerian	£12	Conquerer	£20
Minotaur	£11	Missile Control	£13
Kermit	£46	Enthar Seven	£29
Archeffect	£20	Archeffect	£20
ArcTFS	£25	Lingenuity Presenter	£24
Render Bender	£66		

MINERVA's Archimedes Software

Sigmasheet	£57	Gammaplot	£57
Deltabase	£24	System Delta+	£69
System Delta + Reference Manual			£25
Order Processing*	£53	Sales Ledger*	£53
Stock Manager*	£53	Purchase Ledger*	£53
Nominal Ledger*	£53	Reporter	£20
School Administrator			£66

** Requires System Delta*

Archimedes to BBC SERIAL LINK

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disc, and the necessary cable to connect the two computers. Using this package it is possible to transfer any data from the BBC to Archimedes at upto 19200 baud.

Only £15

Archimedes 5¼"/3½" Disc drive Interface

With this interface it is possible to connect almost any 5¼"/3½" disc drive with its own power supply to the Archimedes. NO SOLDERING is involved. Supplied complete with necessary lead.

Only £21

Note: This is not simply a lead. Attempting to connect an external disc drive by direct connection may result in damage to your Micro.

Watford's 20Meg & 40Meg Archimedes Hard Disc

Watford Electronics' 20Meg & 40Meg hard disc fits internally into the Winchester slot provided. It is fully compatible with Acorn's hard disc upgrade, (the only difference is our low price). Price includes the Hard Disc Drive, Controller Podule & fitting instructions.
P.S. This upgrade requires a backplane and a fan.

Arch HD20 – 20Meg Hard Drive	£379
Arch HD40 – 40Meg Hard Drive	£425
Backplane for 2 Podules	£25
Backplane for 4 Podules	£38
Slimline Quiet Extractor Fan	£9

CREDIT TERMS now available.
In these days of expensive borrowing, we have negotiated a special deal for our customers, which allows us to offer you, low cost finance scheme at 12.25% per annum, typical APR 25.5%. For further details please telephone or write in.

LANGUAGES (Archimedes)

ANSI 'C'; ISO-PASCAL; FORTRAN 77; all Release II.	£94 each
Cambridge LISP; PROLOG X	£181 each
LOGOTRON LOGO	£55
BASIC Compiler	£89
Archimedes Assembler	£189
TWIN EDITOR	£27

BBC MASTER

MASTER 128K Micro incl. Acorn's: View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus £35 worth of FREE OFFER (see below) **£439**

FREE . . . £50 worth of Software

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control, and the popular, Master Advanced Reference Manual. With every BBC Master purchased from us this month.

BBC Master with Turbo Board + above SPECIAL OFFER £535

Securicor Carriage on Micros £7

ADD-ONs & ACCESSORIES

Turbo 65C102 Add-on Module	£118
Econet Module for the Master	£49
Twin ROM Cartridge for Master	£8
Quad ROM Cartridge for Master	£12
Universal Processor Adaptor	£75
Master Reference Manual I	(No VAT) £14
Master Reference Manual II	(No VAT) £14
Master Advance Ref. Manual	(No VAT) £18
64K Upgrade Kit for B+	£32
Acorn 1770 DFS Kit complete	£49
ECONET Upgrade Kit for BBC	£42
ALL ECONET UPGRADES Available	
ARIES' Professional IEEE Interface	£238
Morley Teletext Adaptor with ATS Rom	£99
Filestore E01S £899	Filestore E40s £799
Filestore E60S £1080	Ecolink £270

BBC MASTER COMPACT

System 1	Standard Package	£305
System 1A	System 1 + TV Modulator	£329
System 2	System 1 + Green Hires Monitor	£359
System 3	System 1 + Medium Res Colour Monitor	£469
RS232 Kit for BBC Compact		£25
Additional 3½" Drive for BBC Compact		£90

(Securicor carriage £10)

65C102 2nd PROCESSOR

This amazing package consists of the Acorn 65C102 'Turbo' Board, the Watford Co-Pro Adaptor and Acorn 1.2 DNFS ROM. The 'Turbo' board, running at 4MHz with 64k of additional RAM will increase the speed by between 50 and 200% depending on the application running, and allow a BASIC program of upto 44k in any screen mode. Simply by plugging in the Co-Pro and the DNFS ROM with its special Tube host code and you massively increase the power of any Model B. This is a complete package, with its own power supply, ready to interface with your BBC Micro.

£159

Archimedes A3000 Micro



This new A3000 Archimedes is overall smaller, faster and more affordable. It is supplied with RISC OS, 8MHz ARM processor and 1MB of memory. The neat one box design incorporates a single 3.5" disc drive, parallel printer interface, sound and video outputs, and a mouse.

Price: £649

Please telephone or write in for technical brochure.

0% FINANCE

We are once again able to offer 0% finance for the purchase of an Archimedes Micro. For further details please write in or telephone 0923 37774 ext 203.

VOLTMACE JOYSTICKS

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7

CO-PRO Adaptor



With this Watford's Co-pro Adaptor unit, you can now attach any BBC Master's coprocessors to your original BBC B.
Use the super fast Turbo Board with your BBC B, it is much faster than the 6502 2nd processor superseding it.
With the 512K addon your standard BBC machine achieves IBM PC compatibility at a realistic price running GEM, Lotus 123 and many other programs. Included with the 512k package is a high precision mouse and the Digital Research GEM suite of software; GEM Desktop, GEM Write GEM Paint. This requires both the 1770 DFS and the ADFS to be fitted to your computer.
To use other co-processors you require a BBC B with DNFS 1.20 or higher, or BBC B+ fitted with 1770 DFS 2.20 or greater. Co-processors work exactly like a second processor.
Master owners may use Co-Pro Adaptor to add a second Co-processor externally.
Watford, brings power to your BBC at only:

£35 (carr £5)

REPLICA 3

This new improved REPLICA 3 from Clares is a very powerful disc based TAPE to DISC Utility. It now transfers even more programs than ever before. Replica 3 will not work with all programs but then neither will anything else. 30,000 Replicas have been sold to date. It has to be good.

£15 (40 or 80 track)

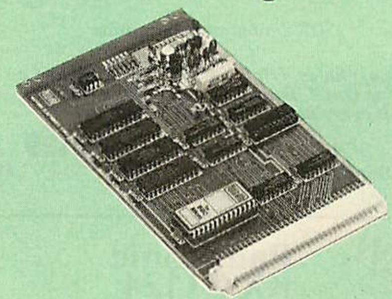
NEW

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.
It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price	**£5.95** (No VAT)
Example programs on Disc	**£4.95**

Archimedes Real-Time Digitiser



Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air television signals may also be digitised via a video recorder or TV tuner.

Once captured, Video images can be stretched, squahsed, rotated, stored on disk, printed, or used by applications software.

Applications include desktop publishing, graphics, animation, image analysis and recognition, medical imaging, automatic inspection and measurement, databases, interactive video, remote transmission of pictures via a modem, movement detection ... or anything else you can think of!

SOFTWARE
All driver software for the digitiser is contained in a ROM on the podule. Software facilities are accessed via operating system star (*) commands and SWI calls. A Utility Disk is included containing sample pictures, examples and Utility programs.

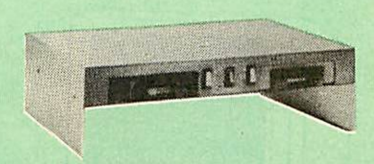
RESOLUTION
Images are digitised to 512 (h) x 256 (v) pixels, and then scaled to fit the Archimedes' screen. It is possible to digitise to 512 x 512 pixels if the picture is stationary for about 0.1 second. 512 x 512 images can either be displayed on a MultiSync monitor, or on a normal monitor using interlacing.
Pictures are digitised to 64 levels of grey (6 bits). Note, however, that it is only possible to display all 64 levels on a monochrome monitor, or a colour monitor which has a composite (CVBS) input. For this reason, the Philips CM8533 monitor is recommended instead of the standard Archimedes monitor. It is also possible to connect both a colour and a monochrome monitor at the same time.
Any 2,16 or 256 colour graphics mode can be used to display digitised pictures. In two colour modes, grey levels are represented using dot patterns, which may be redefined if required (a pattern editor is supplied).

SPEED
Video fields are captured in real time (1/50th sec.), and then transferred to Archimedes' memory or the screen. The grab/display rate is dependant on the screen mode and picture size, up to 25 fields per second for quarter screen images, or 12.5 per second for fullscreen (Mode 9).

HARDWARE
The digitiser is a single width podule, with a BNC socket on the rear panel for the video input, which may optionally be terminated via a link. There is 128K of on-board memory to store the digitised image, and a 32K ROM on the podule contains all the driver software.

Price £249

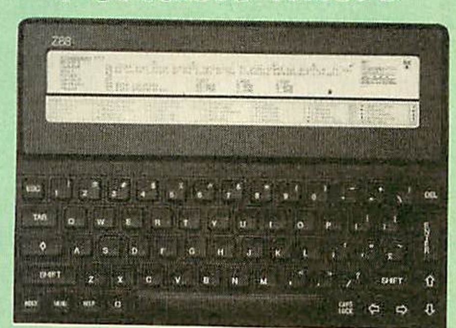
Disc Drives DP35-800S



A Double disc drive – with a difference! Times are changing fast for the floppy disk, and whilst the current standard for the BBC B and Master Series is the 5.25 inch disk, the standard for the future will most certainly be the smaller; faster and more reliable 3.5 inch disks – now a standard feature of both the Master Compact and the Archimedes Series.
To support the present disc drive users, and cope with the future, we have designed our own plinth-mounted disk system – called the DP35 800S, it contains both the 5.25 inch and the 3.5 inch drive formats as well as offer a firm and rigid support for a monitor on top. With the BBC Micro underneath, the plinth makes a surprisingly small footprint on the desk – leaving you more space to work with.
The 5.25" disc drive is 40/80 track switchable. For ease of access, the switches are front mounted. DP35-800S has its own power supply, independent of the BBC Micro.
Watford's new plinth enables users to read, write and format disks both in DFS and ADFS format – currently the accepted standard for the Master Compact and the Archimedes, it also enables the user to read disks written for the Archimedes. Ideal for both BBC & Master.

Launch Offer: **£165** (carr. £7)

Z88 Sinclair's Portable Micro



The worlds first, truly portable Micro. It is A4 size, only an inch thick and weighs under 2lbs. Ideal for use when travelling or as a personal organiser.

Only: **£199**

FREE

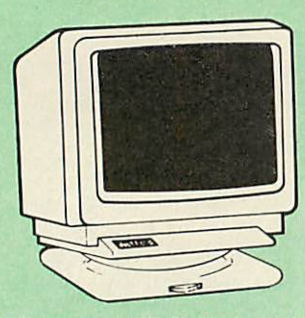
With every Z88 purchased from us this month, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

ACCESSORIES

Mains Adaptor			£8.65
32K RAM Pack or 32K EPROM Pack			£17.35
128K RAM Pack or 128K EPROM Pack			£43.40
512K RAM Pack			£169
Z88 Spellmaster for Pipedream			£51
Z88 to BBC Link	£22	● Z BASE	£56
Z88 to PC Link II	£30	● Z TAPE	£42
Z88 to Macintosh	£49	● Z TERM	£42
Z88 EPROM ERASER			£34.75
Serial Printer Cable			£8.65
Parallel Printer Cable			£24.00
Z88 Modem			£145
Z88 Soft Carrying Case			£8.50
Sinclair Z88 Computing Book			£9.95
AA Nicad Rechargeable Battery			£1.50
Battery Charger, Compact & Fast (3 Hours)			£6

Continued


MONITORS



All Monitors are supplied complete with BBC connecting leads FREE.

MICROVITEC 14"

- 1431 – Standard resolution as used on the BBC television computer programme £175
- 1451 – Medium resolution, suitable for word processing in mode 0 £219
- 1441 – High res, exceeds the capabilities of the BBC micro £359
- 1431AP RGB + PAL and AUDIO £199
- 1451AP RGB + PAL and AUDIO £255
- **2030 CS 20" Med Res £380**
- **2040 CS 20" Hi Res £675**
- Dust Cover for Microvitecs £5.50
- **Touchtec 501 Touch Screen £239**

14" MULTISCAN COLOUR

- **TAXAN** Multisync 770 Plus **£439**
- **TAXAN** Multiscan 870 16" Monitor **£499**
- **EIZO** 9060S Super High resolution multiscan monitor for a wide range of applications. 800 dots x 600 lines. Display for high res VGA. 0.28 Dot pitch **£458**

TAXAN 12"

- Super Vision 2 **Type 620** Hi-res RGB Colour, Green/Colour Switch **£265**
- Super Vision 3 – **Type 625** Super Hi-res RGB Colour, Green/Colour Switch **£315**

PHILLIPS

- BM7502 12" Hi-res Green Monitor **£65**
- CM8833 14" Med. Res Colour Monitor **£219**

STAR BUY

- **PHILLIPS 14"** Medium Res, dark glass, attractively finished Colour Monitor – supplied complete with RGB, SKART and Audio/Phono Inputs. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £199

Dust Cover for Phillips Monitors **£6**

SPARE LEADS

BNC Lead for Zenith or Philips **£3**
Skart Monitor Lead **£5**
RGB lead for TAXAN Monitors **£3**
Archimedes Colour Monitor Lead **£7.50**

SWIVEL BASES

By simply placing your monitor on one of our front adjustable professional swivel bases (see drawing at the top), you can easily adjust the monitor viewing angle.

for 12" Monitors **£8** (carr. £2.50)
for 14" Monitors **£12** (carr. £2.50)

PLOTTERS

- Plotmate A4S **£379**
- Plotmate A3M **£549**

Roland Plotters

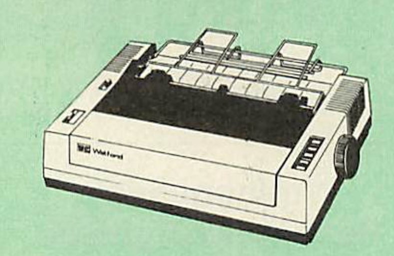
- DXY 880A **£560**
- DXY 1100 **£630**
- DXY 1200 **£879**
- DXY 1300 **£1035**

TAXAN KP-815 PRINTER

Offer Price £155

Taxan KP915 132 Column **£275**
RS232 Interface **£49**
RS232 Interface with 2K Buffer **£69**
RS232 Interface with 16K Buffer **£89**

Panasonic KX-P1081



UK's most popular printer.

(Price inludes, FREE a 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us).

SPRING SALE OFFER only: **£139**
Optional RS232 Interface: **£39**

NEW

Panasonic KX-P1124

Watford Electronics, your authorised Panasonic Premier Dealer, brings you from the prodigious Panasonic Stables, this fabulous 24-pin printer.

Available NOW at a superbly realistic price, KX-P1124 perfectly balances features, quality of construction and Value for Money to produce the printer of tomorrow, here today, ready to sweep the current generation of machines away.

At less than 53dB, this is perhaps the quietest dot matrix printer on the market.

Watford's Launch Offer: **£269**

Panasonic Printers

- **KX-P1180** 9pin 80col. 192/38 CPS **£169**
- **KX-P1540** 24pin 136col. 240/80 CPS **£435**
- **KX-P1592** 9pin 136col. 216/45 CPS **£275**
- **KX-P1595** 9pin 136col. 288/61 CPS **£355**
- **Panasonic KX-P4450** LASER PRINTER Latest technology at Watford's special offer price **£1,499**
- Spare Toner **£29**
- A4 Feeder **£55**
- Drum Unit **£149**
- Developer **£115**

Panasonic Accessories

Cut Sheet Feeders

KX-P1592/1595 (P32) **£175**; KX-P1540 (P35) **£185**
KX-P1124 (P36) **£88**; KX-P1180 (P37) **£79**

BUFFERS

P12 4K Buffer Board for 1081 **£55**
P42 32K Buffer Chip for 1592/1595 **£49**
P43 32K Buffer Chip for 1540/1124 **£49**

Serial Interfaces

P17 P1081/1592 **£32** P19 P1124/1180 **£55**

Original Panasonic Ribbons

Guaranteed to last 3 million characters
P110 for KX-P1081; 1592 & 1595 **£8**
P115 for KX-P1180 **£8** P145 for KX-P1124 **£8**
P140 for KX-P1540 **£10**

INTEGREX COLOUR JET

- Colour Jet 132 Printer **£515**
- Paper Roll **£6.50**
- Screen Dump Software **£10**
- Colour Cartridge **£16.50**
- Black Cartridge **£10.35**
- 100 A4 OHP transparencies **£55**
- 8K Serial Interface Optional **£123**

NEW – Intergrex COLOURCEL NPQ Ink Jet Colour Printer **£2,695**

NEC P2200 PINWRITER

24 pin; 80 column; 168CPS – 56CPS LQ; Epson LQ compatible, 7K Buffer; 7 resident FONTS, Friction & Tractor feed, front load single sheet feed, etc. **£269**

Pinwriter Serial Interface (optional) **£55**
P2200 Cut Sheet Feeder **£59**
Additional Font Cartridge **£25**
NEC P2200 Pinwriter Ribbon **£6**
NEC Ribbons for P6 **£8**; P7 **£9.50**

NEC PINWRITER P6/P7 Plus

NEC P6+ 80 columns **£439** **NEC P7+** 136 columns **£575**
Colour Option **£74** Serial Interface **£73**
Cut Sheet Feeder **£125**

Star Printers

Star LC10	**£169**	LC10 Colour	**£215**
Star LC24-10	**£279**	NB24-10	**£449**
LC10 Colour Ribbon	**£6**	Cut Sheet Feeder	**£65**

Brother HR20 DaisyWheel Printer **£339**

EPSON PRINTERS

EX800	**£410**	LQ850	**£430**
EX1000	**£564**	LQ1050	**£570**
FX850	**£315**	LQ2550	**£925**
FX1000	**£425**	LQ2500+	**£839**
FX1050	**£439**	LX800	**£169**
LQ500	**£275**	SQ2500	**£975**
GQ3500 Laser	**£1150**		

CUT SHEET FEEDERS for

EX800 **£149**; FX800/LQ800 **£149**; FX850/LQ850 **£149**; FX1000/LQ100 **£179**; LQ500/LX800 **£79**; LQ500 **£75**; LQ1050 **£175**.

TRACTOR FEED for

LQ800 **£44**; LQ850/FX850 **£69**; LQ1050/FX1050 **£85**; LQ2500 **£90**; LQ2550 **£90**

ACCESSORIES

- EX800/1000 Colour Option **£55**
- EX800/1000 Colour Ribbon **£18**
- LQ2500 Colour Option **£65**

(Securicor Carriage on Printers £7

EPSON PRINTER INTERFACES

All these interfaces fit inside the printer.

RS232	**£32**	RS232 + 2K Buffer	**£52**
IEEE 488	**£40**	RS232 + 8K Buffer	**£79**

PRINTER LEADS

3BC Centronics 4' long **£5**
BBC Centronics 6' extra long **£7**
Compact's Special Centronics Lead **£7**
Archimedes Printer Lead 1 meter **£6**
Nimbus Centronics Lead **£12**
IBM Parallel Lead 1 meter **£6**
Double Ended 36 way Centronic Lead 4' **£7**
Double Ended 36 way Centronics Lead 6' **£9**
MSX Centronics Parallel Lead 4' **£12**
RS232 Leads (Various) **P.O.A.**

RS-232 GENDER CHANGERS

Male to Female **£4.95**
Male to Male **£4.95**
Female to Female **£4.95**
25 way Male to 9 way Female **£4.90**

Listing Paper (Perforated)

- 1,000 Sheets 9½" × 11" Fanfold Paper **£7**
- 2,000 Sheets 9½" × 11" Fanfold Paper **£12**
- 1000 Sheets 9½" x 11" NCR 2 Part Fanfold **£19**
- 1,000 Sheets 15" × 11" Fanfold Paper **£9**
- 1000 Sheets true A4 Fanfold Paper 70gms **£11**
- 2000 Sheets true A4 Fanfold Paper 70gms **£19**
- Teleprinter Roll (Econo paper) **£4**

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50. 2K Sheets £3.00

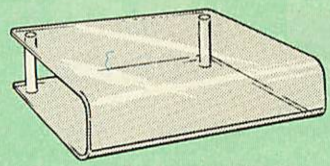
PRINTER LABELS

(On continuous fanfold backing sheet)

1,000	90 × 36mm (Single Row)	£5.00
1,000	90 × 36mm (Twin Row)	£4.90
1,000	90 × 49mm (Twin Row)	£7.50
1,000	102 × 36mm (Twin Row)	£6.25

Carriage on 1,000 Labels £1.00

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand. The printer sits on top and the fanfold paper rests neatly underneath, thus occupying the same space as the printer footprint.

Only: £16 (carr. £3)

Professional Printer Stand



This new professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Additional facilities include: Easy access to paper from both sides, used with both top and bottom feed paper and with its dial controlled paper feed system with adjustable deflector plates it ensures smooth paper flow and automatic refolding.

***80 Column version £23** (carr. £3)*
***132 Column version £26** (carr. £3)*

PRINTER RIBBONS & VARIOUS DUST COVERS

Type	Ribbons	Dust Covers
Brother HR15/20	**£3.00**	–
BBC Micro	–	**£3.50**
BBC Master	–	**£4.00**
Archimedes Micro pair	–	**£9.00**
IBM PCs pair	–	**£6.00**
RX/FX80/MX80	**£3.00**	
DMP2000	**£3.75**	**£4.75**
EX/LQ800	**£4.50**	**£4.50**
EX/LQ1000	**£7.50**	**£5.00**
RX/FX80/85/800/MX80	**£3.90**	–
RX/FX100/1000	**£5.75**	–
Kaga/Taxan KP810/815	**£4.90**	**£4.00**
LC10 (Black)	**£4.25**	**£5.00**
LQ500/800	**£3.75**	**£5.00**
LQ1050/LQ2500	**£8.50**	**£5.50**
LX80/86/800	**£3.80**	**£4.50**
M1009/GLP	**£3.80**	**£3.75**
Panasonic KX1080/81	**£4.00**	**£4.75**
SQ2500	**£23.00**	**£5.50**
Star NL10	**£3.75**	**£4.50**
Olivetti Ink Jet Cartridges (set of 4)	**£9**	

Our attractive Dust Covers are manufactured from translucent PVC. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Universal Printer Sharers/Changers

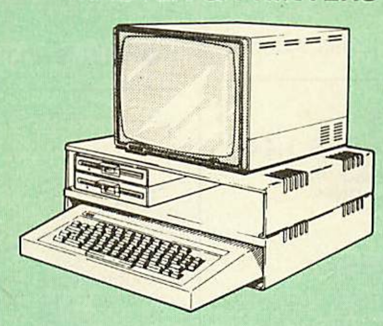
Connect upto 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spagetti Junction of wires). Internal connection is made via high quality ribbon cables.

(Ideal for School environments.)

Connects	Serial	Centronics
2 to 1	£20	£22
3 to 1	£27	£30
5 to 1	£36	£39

(Cables extra at £6 each. Please specify type required when ordering)

PLINTHS FOR BBC MICRO, MASTER & PRINTERS



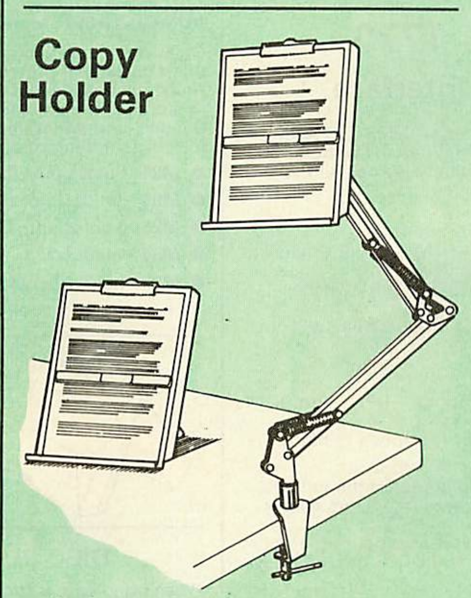
Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationary. The computer slides neatly in the lower section allowing easy access to remove the lid.

The single printer stand is equally sturdy but instead of cooling slots it has elegant cutouts on the sides. This allows easy access to paper from all sides. Colour: BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	**£12**
Double BBC Plinth	420 x 310 x 210mm	**£20**
Printer Plinth	420 x 310 x 105mm	**£12**
Single Master Plinth	490 x 310 x 105mm	**£13**
Double Master Plinth	490 x 310 x 210mm	**£24**

(Carr. Single plinth 12; double plinth £3)

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top **£7** (carr. £3)
Angle poise **£12** (carr. £3)

NEW

Handy 2 Way Printer Switch

A handy two way compact printer switch that enables you to connect 2 Micros to 1 printer, or 2 printers to 1 Micro. Attaches easily to your printer, monitor, etc. A low cost solution for educational establishments. Ideal for those wishing to use a dot matrix and a laser printer. Available in two configurations.

Compact AB Switch Centronics	**£20**
Compact AB Switch RS232	**£19**

(Cables extra at £6 each)

MEGABUFFER 256



The Smallest 256K Printer Buffer Unit in the world **38mm x 130mm x 134mm.**

This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. The features are:

- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatibility with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in test unit for both the buffer & your printer.

Only £149 (carr £5)

THE EPSON RX-FX-KAGA PRINTER COMMANDS REVEALED

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out. Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible Printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from BASIC and Wordwise.

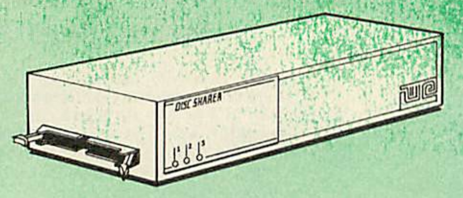
It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

£5.95 (No VAT)



Continued 

DISC DRIVE SHARER



(Ideal for educational establishments)

At last, a low cost alternative to the Econet system. Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Launch Price: **£65** Price includes 3 Cables

NOW WITH EXTRA FEATURES AT NO EXTRA COST – Watford's latest DFS 1.44

- Incorporates Acorn's Official Tube Host Code so that those with 2nd processors no longer need to waste a ROM socket on the DNFS.
- Option to DOUBLE the speed of BPUT and BGET.

WATFORD's & ACORN's DFSs

Watford's popular and widely acclaimed DFS has now been available for six years and has gained a large following amongst serious and educational users of the BBC Micro. Owners of Acorn or any other standard DFS can upgrade to our "Ultimate" DFS merely by replacing their DFS ROM. See below for this upgrade. ***(P.S. Watford's highly sophisticated DFS is fully compatible with Acorn standard DFS). (while Acorn's 1770 DFS is fully compatible with Watford's Mk II DDFS)***

- *Watford's sophisticated DFS ROM only* **£16**
- *We will exchange your existing DFS ROM for Watford's Ultimate DFS ROM for only* **£12**
- *DFS Manual (Comprehensive)* *(no VAT)* **£6.95**
- *DNFS ROM only* **£17**
- *ADFS ROM only* **£25**

(P.S. Our DFS manual is the only comprehensive Manual available for the BBC micro and covers both Acorn & Watford DFSs).

(The Single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

NEW

Watford's MkII 1770

Double Density DFS Interface

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features:

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only **£30.00**.

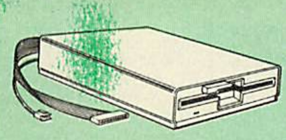
- Special introductory offer **£39.00**
- DDFS Manual (No VAT) **£6.95**
- We will exchange your existing DFS Kit for our sophisticated DDFS for only **£25.00**

Please note, as the MkII DDFS is a hardware and software upgrade, it is not possible for existing Watford DDFS users to simply exchange their ROM for the new version.

DUST COVERS (For our Disc Drives)

Single CLS (without PSU) **£3.20** Twin CLD (without PSU) **£3.85**
Single CS (with PSU) **£3.95** Twin CD (with PSU) **£3.90**

Special 40/80 Disc Drive/DDFS Mk II Offer



- The popular 40/80 track 400K single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.
- Watford's extremely popular DDFS Disc Interface (allows 720K storage). Will run in both, Single & Double Density modes.
- A comprehensive User Friendly Manual.

A Bargain at Only **£123** (£7 carr) (Offer valid while stocks last)

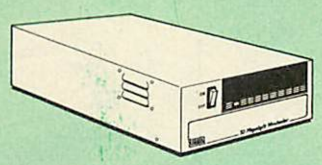
3½" DISC DRIVE OFFER



These top quality 3½" Double sided, *80* track, 1 Megabyte (unformatted each Disc Drives), are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc. They run directly from the BBC B/Master's own PSU.

- **CLS35 400K Unit £69**
- **CLD35 800K Unit £125**

WATFORD's WINCHESTER DRIVES



Undoubtedly the best value for money Winchester Hard disc available anywhere for the BBC Micro.

This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with a Utilities Disc.

Finished in rugged metal and fetching BBC beige, the Winchester has an internal fan, so quiet you won't even hear it! A switched mode power supply and a neon-lit on/off switch are there along with a light on the hard disc to tell you when it is working – just compare the price with our competitors' 20 or 28 Mbyte discs!

Compatible with the Master, and the BBc B (with 17 X disc interface).

- 30 Megabyte BBC Hard Disc **£405** (carr £9)

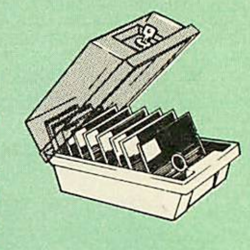
FLOPPY HEAD CLEANER KIT

The heads in floppy drives are precision made and very sensitive to dirt. The use of a cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3½" & 5¼", please specify.

£4

ANTISTATIC LOCKABLE DISC STORAGE UNITS

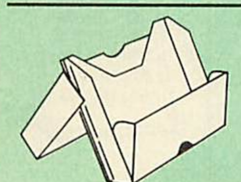
Gives double protection – Strong plastic case that affords real protection to your discs. Antistatic helps avoid data corruption whilst in storage. The smoked top locks down. Dividers and adhesive title strips are supplied for efficient filing of discs.



- **M35** - holds upto 50 5¼" discs **£4.95**
- **M85** – holds upto 95 5¼" discs **£6.95**
- **M25*** – holds upto 25 3 ½" Discs **£4.95**
- **M50** – holds 50 3½" Discs **£6.50**
- **M10** – holds 8 of No. 10 Data Cartridges **£15**

* Not lockable

PLASTIC LIBRARY CASES



Holds up to 10 5¼" Discs. **Only £2.00**

DISC PLONKER RACK

When using ones micro, there is a tendancy to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk.

Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds upto eight 5¼" discs.



Protection at Only: **£2**

DISC ALBUMS

Attractively finished in black leather look vinyl. Stores upto 20 Discs. Each disc can be seen through the clear view pocket. **£4**

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below.

The first capacity given in the first column indicates capacity in single density mode. That within the brackets is the capacity in double density mode. All disc drive type numbers start with the prefix "C".

The tinting on some of the boxes is used to indicate which Drives are 40 track (non-tinted) and which are 80 track (tinted). All our 80 track drives are already fitted with a 40-80 select switch.

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. *Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.*

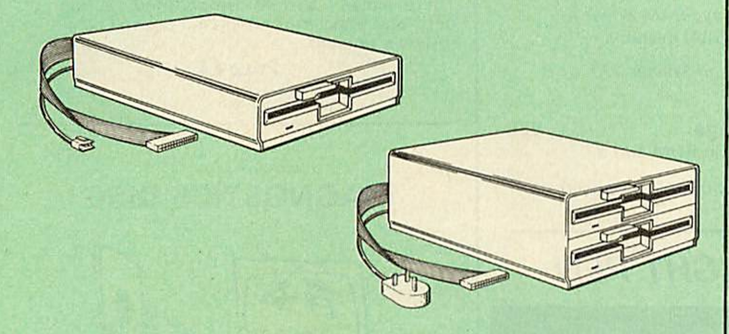
Various UK "manufacturers" of disc drives for the BBC micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. Ideal for Schools & Colleges. We are now able to supply all single disc drives with Power Supply, in either single or dual case. (Dual case has a twin data cable and a power supply capable of driving two disc drives) allows easy expansion to a dual drive unit, at a later date. Prices stated in the pricing boxes below are for single drives in standard single cases. Single drives in a dual case cost an extra £10. (At Watford we anticipate your needs of tomorrow, not just today)!

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space) your BBC, Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with Watford plinth. (Turn to the 4th page of our advert for the Plinths).
P.S. All our 5¼" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.

Our Disc Drives conform to BS415



"Test Bureau Approved for Use in Education"

Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
400K (720K)	CLS400S £79	CLD 400 £168	CS 400S £89	CD400 £188
800K (1.44M)		CLD 800S £159		CD 800S £169

● TWIN Disc Drive Case, complete with Power Supply & Cables **£43**
Securicor carriage on Disc Drives £5 to £6

Prefix ***C*** *= Cased Drive*
L *= Less PSU*
S *= Single*
D *= Double*

Suffix ***S*** *= 40-80 Switchable*

e.g. CLS400S = Cased Disc Drive, Less power supply unit, single 5¼" 400K, (720K in double density); Double sided; 40/80 track switchable.

Cable to connect 5¼" Disc Drives to BBC Compact
Single £9 Twin £12
Special Cable to connect both 3½" and 5¼" Disc Drives simultaneously to the BBC Compact £13

Mysteries of Disc Drives & DFS Revealed

Are you tired of faulty cassettes, and lengthy loading times? Do you want to upgrade your BBC micro to take discs but you get tied up in the plethora of jargon surrounding the choice and use of these systems.

Then The Mysteries of Disc Drives and DFS Revealed is the book for you. It explains in detail the different types of systems available, how they are installed and how to use them. Many examples are given including pre-written programs to call various functions of the DFS available only through Operating System calls. Different types of disc, 40/80 tracks etc. are all explained. This book is ideal for the beginner confused by the plethora of choice available in the marketplace.

£5.95 (Book No VAT)

3M – DISKETTES

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor.

- *10 × 5.25" S/S D/D 40 Track Diskettes (744)* ***£6.00***
- *10 × 5.25" D/S D/D 40 Track Diskettes (745)* ***£7.00***
- *10 × 5.25" S/S D/D 80 Track Diskettes (746)* ***£11.50***
- *10 × 5.25" D/S D/D 80 Track Diskettes (747)* ***£11.00***
- *10 × 5.25" 1.6M D/S D/D High Density Discs for IBM XT and AT* ***£16***
- *10 × 3.5" S/S D/D 40/80 track Discs* ***£10.00***
- *10 × 3.5" D/S D/D 40/80 track Discs* ***£11.75***
- *10 × 3.5" High Density Diskettes* ***£25***



Purchase any 5 packs of the above 3M Diskettes from us during the months of May & June '89, and qualify for a FREE 3M's attractive Black Designer's watch.
(Offer subject to availability)

TOP QUALITY 3.5" & 5.25" DISKETTES

To complement our range of Quality Discs and Disc Drives, WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

- *10 ×* ***M3*** *3.5" D/S D/D 80 Track Discs* ***£10***
- *10 ×* ***M9*** *3.5" Double Side High Density* ***£25***
- *10 ×* ***M4*** *5.25" S/S D/D 40 Track Discs* ***£5***
- *10 ×* ***M5*** *5.25" D/S D/D 40 Track Discs* ***£7***
- *10 ×* ***M7*** *5.25" D/S D/D 80 Track Discs* ***£9***
- *10 ×* ***M8*** *5.25" D/S H/D Hi-Density Discs* ***£14***
- *3" Double Sided Discs* ***£2.50*** *each*

Special BULK OFFER on 5¼" DISCS

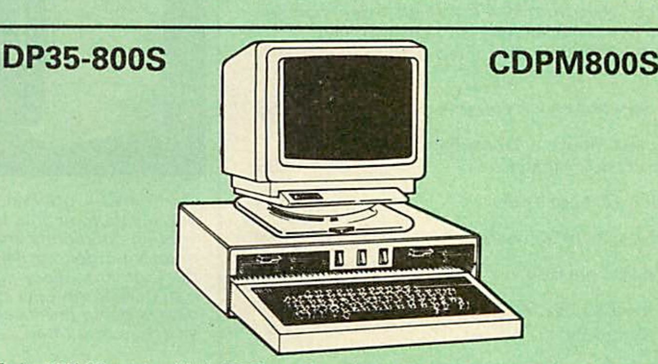
PRICES SLASHED

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
● Without Sleeves	£35	£39	£45
● With Sleeves	£38	£42	£48

DP35-800S **CDPM800S**



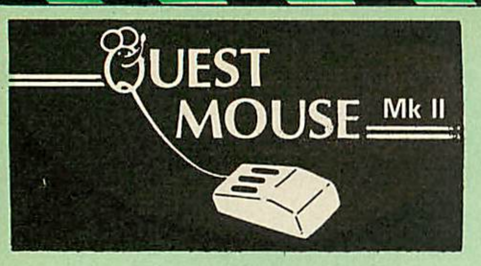
Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

CDPM 800S for the BBC & Master £182
DP35-800 for BBC/Master £165
(For DP35-800S spec. see Page 2 of our advert)
(Securicor Carr. £7)

(The above drive units are 2 Megabytes unformatted)

Continued





The ultimate in Mouse technology, the Watford Electronics Quest Mouse must be the most powerful Mouse package yet produced for the BBC Micro. Featuring state of the art 32K ROM software the Quest Mouse package is filled with features essential to the budding artist. The Quest Mouse is a high precision, low profile and large footprint mouse. It has three large comfortable buttons and its RUBBER COATED STEEL BALL is smooth and easy to use on virtually any work surface. This also eliminates any directional bias that one encounters on the most well-known mouse for the BBC. The Quest Mouse is FULLY HARDWARE COMPATIBLE with the AMX MOUSE so that it will work with any of the AMX range of software.

The two parts of the Quest package are available separately so that existing Mouse owners can upgrade to the Watford's sophisticated Quest Paint software or replace their existing worn out mice for a minimum cost.

QUEST PAINT

The software is used to draw high resolution Mode 1 pictures in full colour. All menu selection and control of the drawing process is performed with the mouse so that you will hardly ever touch the keyboard.

SOFTWARE FEATURES

The software is far too powerful for us to describe it fully in such a small space. Below is a list of the various features. Please write to us for a fully descriptive leaflet.

Disk interface not required. Utilities disk has facility to create and print big screens. Colours applied can be solid, either pattern of user defined pattern. Drawing can use brush or airbrush. Brush shapes can be defined and stored. Airbrush sprays colour/pattern randomly with four jet sizes and even or center spread. Colour cycles. Colour protection to stop particular colours from being overwritten by selected drawing actions. All standard drawing facilities like: rubber, straight pencil lines, triangles, circles, ellipses, rectangles, parallelograms, polygons, etc are provided. All shapes can be solid or just a boundary line. Once a shape has been set up it can be repeated anywhere on the screen. Global colour replace in a rectangle. Powerful fill facility for areas and vertical/horizontal lines. Full cut and paste of rectangular areas with rotation and size with screens from Watford Beeb Video digitiser. Load and Save screens with colour pallet information, save brush and pattern definitions etc.

- Quest Mouse II & Quest Paint — £58
- Quest Mouse II, Quest Paint, AMX Stop Press & Pagefont — £89
- Quest Mouse II only — £29
- Quest Paint Software only — £34
- Quest Font Disc — £15
- Quest Mouse Mat (Red or Blue or Green please specify) — £3
- Part Exchange your unreliable AMX Mouse for a Quest Mouse for only — £22
- GXR ROM for the BBC Micro — £22

(P.S. Quest Paint is not compatible with BBC Compact)

N.B.
1. Quest Paint supplied complete with Software in a 32K ROM, Comprehensive User Guide and a Utility Disc.
2. Quest Font Disc has 22 text FONTS for use within Quest Mouse.

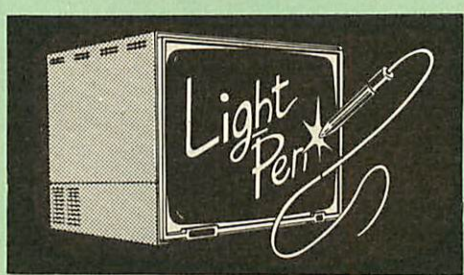
ConQuest

Watford's Quest package is an extremely powerful and flexible drawing package, with very wide and unusual features. However, since its launch various suggestions for even more advanced & powerful facilities were received from the Quest users. ConQuest allows you these more advanced facilities, like, distortion of a cutout to any shape and a full font designer. If you also have a GXR ROM in your machine or you are using a BBC Master then ConQuest will take advantage of this to give ellipses at any angle, sectors and arcs, etc. Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.
Some of the features are:

- *Pick filenames off the screen for loading and saving.*
- *Rotate a cutout to any angle and Distort it to any four sided shape.*
- *Has Built in Font editor.*
- *Default brushes and patterns on startup.*
- *16 x 16 font available on start up.*
- *Ability to reset patterns, fonts and brushes to default at any time.*
- *ROM based enhanced Epson and compatible printer dump.*
- *ROM based enhanced extended picture routine.*
- *Ability to create and abort extended pictures.*
- *Improved disk access speed for extended pictures.*
- *User definable sideways RAM driver for incompatible sideways RAM systems.*
- *Ellipses at any angle on Master 128 (or B with GXR ROM).*

ConQuest ROM Package — £30
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

MARK II LIGHT PEN



Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted.

Price Only £21

FLEET STREET EDITOR

Software pack for BBC Micro	£33
Software pack for the Master	£39
Software Pack for Compact	£40
Admin Xtra Disc Utility	£13
Walt Disney Disc Utility	£13
Fonts N Graphics Disc Utility	£13

RB2 Marconi
TRACKER BALL

RB2 (AMX/Quest compatible)	£45
RB2 including Quest Paint	£75

THE NEW Mk III AMX MOUSE

ONLY: £59 Inc. Super Art package (carr £3)
(Please specify for BBC, Master or Compact)

MOUSE MAT	£3
AMX MOUSE ONLY	£29
AMX UTILITY Package	£13
AMX SUPERART Package	£34
AMX STOP PRESS – A Desktop publising software. Works with Keyboard, Joystick or a mouse	£32
PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	**£13**
AMX DESIGN (ROM)	£55
AMX XAM Educational	£15
AMX EXTRA EXTRA	£16
AMX MAX A gem of desktop (ROM)	£15

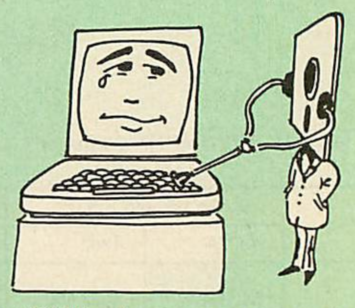
NEW

WE MOUSE HOUSE

Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, Monitor, disc drive or desk.
It protects it from damage when not in use, yet within easy reach when you need it again. There is also a second compartment for your pens and pencils – and at £4 it doesn't cost a rodent's ransom.

Price £4

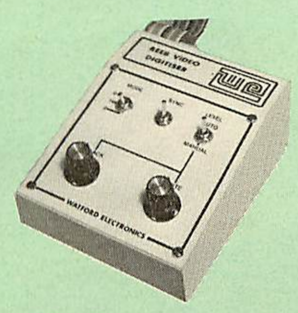
DIAGNOSTICS DISC



The BBC Micro is a very complex machine and thus diagnosing a fault can be very difficult. At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste time and money taking it to be looked at.
The solution to these problems is here now, in the form of the Watford's Diagnostics Disc. This excellent utility is specially designed to test out the following areas of your Beeb:
RAMs, ROMs, ULAs, Sound, Keyboard, Disc, RS423, ADC, User Port, Printer Port, Cassette, Joysticks, Speech, Disc Drives, 6502 and Z80 2nd Processors.
This utility is an invaluable aid for all those who take the reliability of their system seriously. A comprehensive manual provides full operating details and a list of possible causes and remedies for any faults that you may find along the way. The package also enables a permanent equipment and service record to be maintained.

Only £20.00

BEEB VIDEO DIGITISER



"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro.

This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem.

The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

Both the black and white levels can be adjusted manually for the optimum picture, or switched to automatic for unattended use. The image produced can be reversed if necessary.

Full controlling software is supplied on a normal sideways ROM and this is easily accessed via additional * commands. The package i designed to allow easy input of complex screens and give full access of the data to the user. Once on the screen, the image can be used as a normal graphics screen, allowing any of the usual graphics commands in BASIC or other ROMs to work on it.

A special print dump routine is included with the driver programs. This is specially designed to produce a fast, correctly proportioned picture, with reduced "contouring", resulting in an accurate reproduction of the original image.

Detailed examples of driving this unit from BASIC or other languages are all provided in the extensive manual supplied.

£109 (Carr. £5)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)
(BBC B+ and Master compatible, except Master with Econet)

Magazine Maker

(As seen on TV)

A combination of the Pagemaker and Watford's Beeb Video Digitiser.

Using any video that provides a composite signal and the digitiser, images from a camera or TV can be converted into a graphics screen on the BBC Micro.

They can then be used within Stop Press to illustrate magazines or newsletters – in fact anything that needs to be created on A4 size paper.

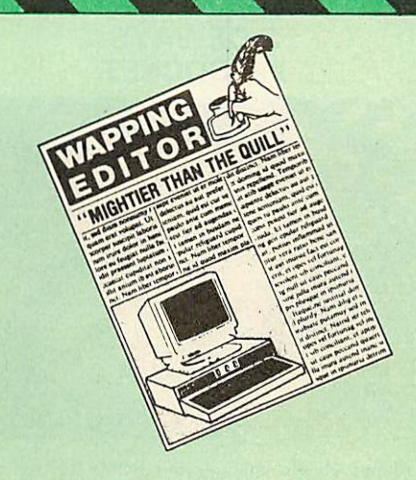
With Stop Press's many features, a variety of pictures can be composed – the only limit being the imagination.

Pictures can be doctored using Stop Press's graphics option to produce any number of effects.

Text can be formatted around the digitised photo on screen using the facilities available, which include 16 typefaces, character and pattern definer, text formatting and the ability to load in wordwise and viewfiles plus much more.

Once created the picture can be printed out. The Magazine Maker is suitable for any use that requires illustrated documents.

Complete Package **£135.00** (carr. £3)



Watford Electronics bring professional quality Desktop Publishing to the Beeb. The Wapping Editor is a totally self contained mouse-driven desktop publishing package designed to run on the BBC B, B+ and Master computers. The massive 64K Rom contains ALL the software you need to do your own publishing. It 'Brings the Freedom of Press' to your fingertip. The software has a word processor, a graphics package, a page layout section and a font designer. Although very sophisticated, Wapping Editor is simplicity itself to use. Anyone already familiar with Quest Paint will immediately feel at home.

GRAPHICS PACKAGE

Imagine Quest Paint re-written to take advantage of the high resolution of Mode 0, well this is it. The Wapping Editor could well be worth buying for this facility alone. This must surely be the graphics.

WORD PROCESSOR

This section is a fully functional word processor specially tailored to suit the Desktop Publishing environment. Gone are all the unnecessary and cumbersome text formatting commands – these are dealt with in the 'Page-Layout' section. The features of this word processor include wordwrap, wordcount, insert/overwrite, move block, copy block, delete block, search and replace, browse, etc, many of these features being mouse controlled. Text input can of course be taken from existing word processor files like Wordwise, View, etc, but it is not necessary to have a separate word processor in order to use this package.

PAGE-LAYOUT SECTION

Page Layout becomes easy using these mouse-driven routines. The user simply 'pulls' a rectangle onto the page and states which text document or graphic is required to fill the space – it's as simple as that! Text can be automatically printed in a pre-set number of columns, left justified and/or right justified, or centered. Several different typefaces can be held in memory at one time. Graphics may be stretched, squahsed or cropped to fit any size rectangle. Graphics input can be from the software provided in the package or, using the 'mode convert', from any graphics mode screen.

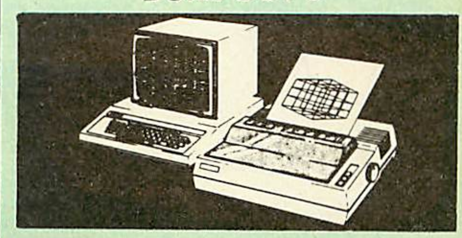
THE FONT EDITOR

This is an enhanced version of the font editor contained in the Con-Quest ROM and allows the editing of ALL 95 characters. As well as being able to design your own typefaces, fonts from other DTP packages or from Quest Pain may be loaded into the editor and converted for use with the Wapping Editor. This sophisticated editor has numerous functions including slide, flip, invert and rotate individual characters or the whole font. Individual characters can be mirrored or copied and a mask feature allows you to superimpose two characters. Lines and columns can be inserted or deleted allowing the character to be stretched or squashed. This font editor will also allow 'font' and 'brush' files to be designed for use with Quest Paint.

This package is the latest in the line of integrated professional quality mouse-driven software from Watford Electronics, the company that adds power to Beeb.

Wapping Editor — Launch Offer: **£69**
Wapping Editor with Quest Mouse — **£89**

DUMPOUT 3



A highly sophisticated screen dump ROM. This has to be the most flexible and powerful screen dump ROM yet produced for the BBC micro. It will put on paper anything you see on the screen, including full Mode 7 graphics. Also provided are window setting utilities and OSWORD calls to plot and read Mode 7 graphics pixels.

Facilities:

- Vertical and horizontal scaling in all graphics modes and mode 7
- Rotation of image by 90, 180 or 270 degrees
- Left hand margin setting
- Screen dump window setting
- Colours appear as grey scale
- Two tone fast dump
- Colour mask
- Mode 7 contrast expansion
- Mode 7 contiguous dump

For use with the following printers:

GLP, GP80/100/250, CANNON, STAR, KAGA/TAXAN, NEC, SHINWA CP80, GEMINI, EPSON MX/RX/FX, M1009, NEC PC8023, DMP100/200/400, Panasonic KX1081/82, Mannesman Tally and compatibles.

Only: £25

OFFICE MASTER



CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trail balance.

FINAL ACCOUNTS – Will take data prepared by the Cashbook module and produce a complete set of accounts as following: Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST – A very versatile program. Enables you to keep records of names and addresses and then print, examine, sort and find them, all with special selection techniques.

EASILEDGER – A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

INVOICES & STATEMENTS – Greatly reduces the time and cost of preparing Invoices and Statements by storing essential information like customer names, addresses and account numbers. Has VAT routines and footer messages facility.

STOCK CONTROL – Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only **£21** (Disc)

OFFICE MATE



- DATABASE
- BEEBCALC SPREADSHEET
- BEEBPLOT GRAPHICS

DATABASE – Set up a computerised card index system with powerful search facilities.

SPREADSHEET – Offers many calculation and editing features.

BEEBPLOT – Provides visual representation from Spreadsheet data.

OFFICE MATE Only £10 (Disc)

Continued




ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Comal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved *FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on your BBC micro – no flying leads to connect and no soldering. Provision of the on-board ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

● Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: **£80** (carr. £2)

Aries B-12 Sideways ROM Board

This board is extremely well made, simple to install, reliable when fully loaded and compatible with the Aries-B20 and the Aries-B32.

The B12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

The B12 system consists of two parts: a large detachable "mother board" which carries the extension ROM sockets and a small "base board" on a short ribbon cable, which plugs into the existing sideways ROM sockets. This two-board design eliminates the reliability problems previously associated with some other ribbon-cable based systems.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost.

Price: Aries B-12 **£40**
Aries B-12C **£5**



ARIES B-488 IEEE-488 INTERFACE UNIT

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP-IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

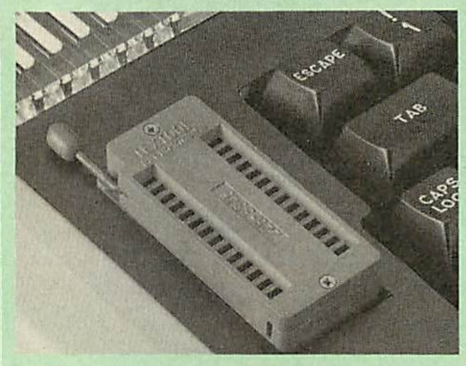
£238 (Carr £3)

EXTERNAL ROM BOARD for BBC MASTER

This external Beige finished, free standing cased unit with its own Power Supply allows you to plug-in upto 12 ROMs and 16K Sideways RAM.

Only £78

SIDEWAYS ZIF SOCKET



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

● Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.

● The low profile of the socket allows unrestricted access to the Keyboard.

● All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.

● This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for all professionals and Hobbyists alike.)

● BBC, B+ and Master compatible.

ONLY **£18** (carr £3)

Low Profile CARTRIDGE SYSTEM

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

● Complete System	**£11**
● Spare Cartridges	**£2.50**
● Spare Rack	**£1.50**

ROM Cartridges for the BBC Master
Twin **£8**; Quad **£12**

16K DISC RAM

(16K Sideways RAM Module)

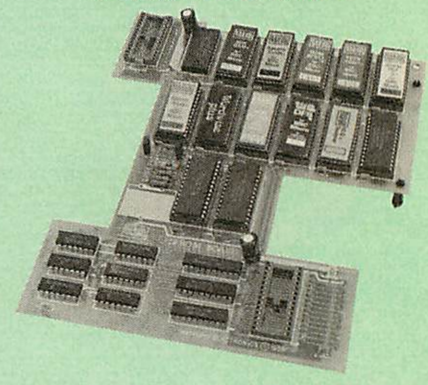
Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.
Key points to note about this new addition to the Watford range of products are:

● Write protection (useful in a variety of circumstances).
● Compact construction.
● Supplied complete with Battery Backup.
● No overheating or overloading problems.
● Free utilities disc supplied.
● Can be used as a 16K PRINTER BUFFER.
● Ideal for professional software development.
● Supplied with utilities software disc.

Only: **£35** (carr £2)

P.S. 16K Disc Ram Board is not designed to work in conjunction with a Sideways ROM Board.

SOLDERLESS SIDEWAYS ROM SOCKET BOARD



In the May 1986 Micro User's independent review, the writer concludes, "The board has been well laid out. Its position is much better than others – not over the HOT RAM chips and further away from the disc controller area". "I give the solderless ROM board the thumbs up and wish it success".

This brand new board from Watford Electronics is designed specifically for those wishing to add a ROM board to their own BBC without the need to perform any soldering.

This new board expands the total possible number of ROMs in a BBC from 4 to 16.

Unlike our competitors inferior boards, the ONLY upgrade required for fitting battery backup to the Watford Solderless ROM board (all Watford ROM boards, actually) is the fitting of the battery itself. (No other expensive components are required.)

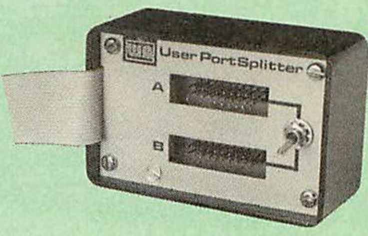
● The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:
● Increase your BBCs capacity for ROMs from 4 to 16.
● **No soldering required.**
● Very low power consumption.
● Minimal space required.
● Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
● Socket 14 takes two 6264 RAM chips.
● Read protect to make RAM "Vanish") allows recovery from ROM crashes.
● Battery backup option for RAM chips.
● Supplied ready to fit with comprehensive instructions.

Price: Only £35
Battery backup fitted **£39**
Battery Backup only **£3**
(carriage £2)

● Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

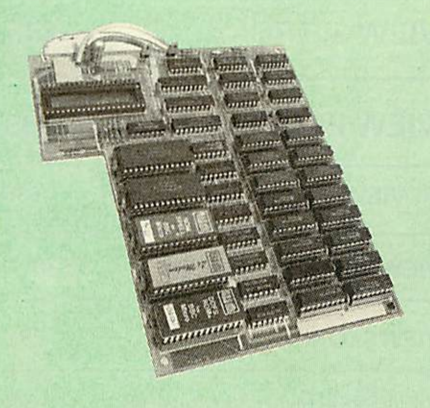
USER PORT SPLITTER UNIT



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaniously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination.

Excellent Value at **£22** (carr £2)

ROM/RAM CARD



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 3 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO overheating problems.
- No User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Firm mounting in BBC micro.
- Compatible with all BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of Battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- Accepts any ROM.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE Fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROM-SPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

Please write in for further details.

INTRODUCTORY PRICES:

- ROM/RAM card with 32k dynamic RAM ***£48***
- ROM/RAM card with 64k dynamic RAM ***£65***
- ROM/RAM card with a massive 128k dynamic RAM **£109**

(carriage on ROM-RAM Card £3)

OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit **£17**
- 16k Dynamic RAM for Upgrade **£17.50**
- Battery backup **£3**
- Read and Write protect switches ...... **£2 each**

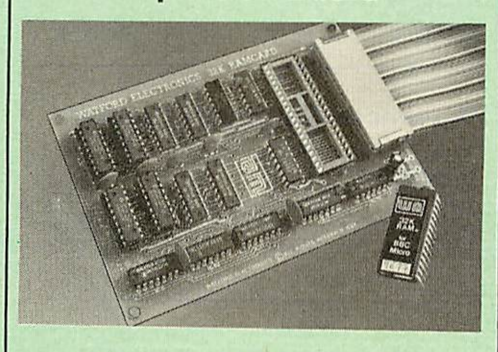
Complete ROM-RAM board
All options installed **£115**

P.S.
Is your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford ROM/RAM Board and pay £5 less

32K

SHADOW RAM-Printer Buffer

Expansion Board



A MUST FOR WORD PROCESSING

Watford Electronics now brings you the latest state-of-the-art MEMORY EXPANSION BOARD for your BBC microcomputer. Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16K or even 20K, but a massive 32K of extra RAM!!!

- IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer – type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free – 5 times as much as normal.

- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24K of text in memory. This product is recommended as an ideal complement by Computer Concepts.

- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20K of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28K of program space.

- Use the FULL 32K or the bottom 12K of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS423 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138,145,ADVAL etc). Please note only a 12K printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

- Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

- Recommended by Computer Concepts foı use with their Inter series of ROMs.

Only £59 (carr £2)
(Price includes a comprehensive manual and the ROM)

INCREDIBLE WORDPROCESSING DEAL

Watford's 32K SHADOW RAM CARD and Computer Concept's INTERWORD Wordprocessor package.

at Only **£89** (carr £2)

BBC SOFTWARE'S Popular Educational Software

- Maths with a Story 1 (Disc). 4 primary level maths programs **£11.25**
- Maths with a Story 2 (Disc) 4 further maths programs **£11.25**
- Picture Craft (Disc) 6 - 14 age group. Pack consists of flexible geometrical design & colouring programs **£17**
- WAVES: Science Topics (Disc) CSC O Level Physics program. **£14.95**
- RELATIONSHIP: Science (Disc) O Level Biology program. **£20.00**
- BONDING: Science (Disc) O Level Chemistry program. **£20.00**
- ELECTROMAGNETIC SPECTRUM (8 Discs) O Level program. **£20.00**
- ELECTRONICS IN ACTION (Disc) O Level program **£19.95**
- NEWTON & THE SPACE SHUTTLE (Disc) O Level program. **£20**
- ECOLOGY (Disc) O Level program. **£20**
- POLYMERS (Disc) O Level program. **£20**
- Clasification & Periodic Table O Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule. **£20**
- FOOD & POPULATION (Disc) O Level program. **£20**
- MICROTECHNOLOGY (Cassette) O Level program. **£11.25**
- A VOUS LA FRANCE (2 Cassettes) A French language home study aid. **£21.70**
- DEUTSCH DIREKT! (Disc & Audio Cassette) **£19.95**
- Modem Master (Disc) **£11.25**
- ADVANCED TELETEXT SYSTEM **£8.65**
- PERIOD TABLE SOFTWARE **£20**
- Astronomy – Primary (Disc) **£12**
- Computers at Work – Primary **£17.35**
- Introducing Geography – Primary **£17**
- **Introducing Geography 11-17yrs** **£17.50**
- Electric Fields 6-14 years **£11.25**
- BlackQueen Contract Bridge **£13**
- Espana Viva – 3 Discs **£19.95**
- A Vous La France Disc **£21.50**

Acorn's Speech Synthesiser package, complete
Special Offer £15
BBC B Micro only

Versatile **BEEB SPEECH SYNTHESISER** Unit



The Watford Speech Synthesiser is a very flexible speech synthesis unit based upon the powerful phonemes system. This system stores the building blocks of speech (called phonemes) and allows you to combine them quickly and easily to form virtually any word imaginable.

Supplied with an advanced ROM, you are provided with a 500 word dictionary to get you started. These can easily be added to by following the notes given in the comprehensive manual.

SPECIAL PRICE £32 (carr £2)

Continued 

COMPUTER CONCEPT'S ROMS

ACCELERATOR	£30
CARETAKER Basic Utility	£23
DISC DOCTOR	£28
Graphics ROM	£29
TERMI	£25
COMMUNICATOR	£49
Printmaster	£24

Wordwise £26

Wordwise plus £40

We are giving away absolutely **FREE**, the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear text-segment area.
- BBC B, B+ and Master compatible.

Only **£24**

(N.B. Word Aid requires a Disc Interface in your Micro)

HI-WORDWISE-PLUS DISC: £5

SPELL MASTER £42

Inter SHEET ONLY £37



ONLY: £25

Inter-WORD £36

MEGA-3 ROM

Interword, Intersheet & Interchart – 3 in one ROM £76

INTERBASE £49

All Prices Exclusive of VAT

MINI OFFICE II

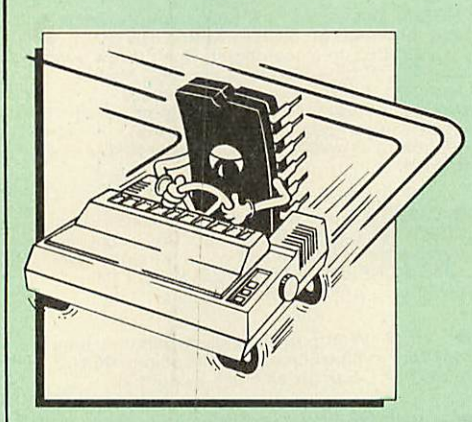
DISC Version for BBC B & B+	£14.00
DISC Version for BBC Master	£16.50
Disc Version for the Compact	£18.00

(When ordering please specify for which Micro & 40 or 80 track Disc).

Advanced Computer Products

Advanced Disc Toolkit	£30
Advanced Disc Investigator	£25
Advanced 1770 DFS BBC	£29
Advanced 1770 DFS Master	£30
Advanced File Manager	£25.00
Advanced Control Panel	£30.00

VIEW PRINTER DRIVER ROM



View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing only at a small outlay.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, FX, LX, JX80 range, HI80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redefinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute * command when printing.

Other features include a very powerful on screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips. (Write in for a detailed leaflet).

Price: Only £33

VIEW

VIEW WORDPROCESSOR 2.1	£35
VIEW 3.0 ROM	**£48**
VIEW PROFESSIONAL	**£59**
HI-VIEW (for 6502 2nd Processor)	£36
VIEWSHEET (Acornsoft)	£36
VIEWSTORE	£36
VIEWSPELL with 80 track disc	£29
VIEWPLOT Disc (Please specify for Master 128 or Compact)	£20
VIEW-INDEX	£12
OVERVIEW Packs 1 & 2	£69

Watford's own Sophisticated VIEW PRINTER DRIVERS

Epson FX80 & Kaga KP (Disc)	£8
Juki & Brother HR15 (Disc)	£8
Silver Reed Printers (Disc)	£8

THE COMPLETE BBC COMPUTER USER HANDBOOK

"Why has no-one written a book like this before? It's long overdue".

If you own a BBC-B, BBC B+, Electron, Master 128, Master Compact or Archimedes then this book is for you. It shows you how to get the most from your computer, and how to make the computer work for you. Although some sections are machine specific, most of the information, programs, hints and good solid experience are for the whole range of BBC machines. The general style and level means that both beginner and expert will feel satisfied with the quality and quantity of the material.

GENERAL – Uses and abuses of computers.

HARDWARE – How to design your own work station. Hardware additions (disc drives, ROMs, printers, 2nd processors, etc). DIY alterations.

HARDWARE RUNNING BBC-BASIC – All BBC machines are described with their differences. Compatibility between the various BBC machines. Networks. The Archimedes and its advantages.

GETTING ORGANISED – so that you keep track of your programs and control of your software. Setting up for easier programming sessions.

NEAT PROGRAMMING – Good style. Writing structured programs. Getting the best from BBC-BASIC, Graphics and screen displays. Speeding up programs. Saving space.

GENERAL PROGRAMMING TIPS AND HINTS – with a multitude of examples (eg input vetting, dealing with dates, blanking out function key messages, error trapping, disabling ESCAPE and BREAK, use of EOR with colour, etc).

DEBUGGING – Specific errors and how to handle them. How to test programs fully.

STANDARD PROGRAMS – Assessing word-processors, spread-sheets, databases, graphics packages, communications etc. How to customise them to your own requirements.

COMPUTERS AT HOME AND IN THE OFFICE – Introducing the computer to the office. Program protection. Computers and the law. Communications. Selling your own programs. 28 FULL CHAPTERS, elegantly written and extensively indexed. To dip into, consult, or read from cover to cover, again... and again... and again... **£14.95** (Book No VAT)

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£5.95
15 Hr Wordprocessing BBC/WW & WW+	£5.95
30 Hour BASIC (BBC Micro)	£12.95
6502 Assembly Language Programming	£19.95
6502 Application	£13.95
6502 Development Package	£7.50
6502 Programming the	£16.95
6502 Reference Guide	£10.95
68000 Assembly Language	£15.95
68000 Assembly Language Prog.	£10.95
68000 Assembly Language Techniques	£24.95
68000 Machine Code Programming	£13.00
68000 Microprocessor Handbook	£14.95
68000 Programming the	£22.95
68000 User Guide	£8.95
6809, Programming the	£18.95
Advanced User Guide for BBC	£10.95
Amiga Hardware Ref Manual	£23.70
Amiga Machine Lang. Guide	£19.95
Art of Microcomputer Graphics	£16.95
Assembly Language Prog. for the BBC	£10.95
AY-3-8910 Programmable Sound Generator Data Manual	£3
BASIC 2 – User Guide	£2
BBC – Advanced Graphics with the	£11.75
BBC – Advanced Programming Techniques for	£8.95
BBC Basic Guide	£19.95
BBC – Mastering Assembly Code	£8.95
BBC Micro & the small Business	£5.75
BBC Micro – File Handling On	£8.50
BBC Micro – within the	£13.95
BCPL User Guide	£14
BCPL The Language & its Compiler	£8.50
C Big Red Book of	£7.50
C - A Dabhand Guide to	£14.95
C for Programmers	£9.95
C Programming Lang. 2nd Edition	£24.95
COMAL – Introduction to	£9.50
Complete FORTH	£6.95
Computer Graphics & CAD fundamentals	£9.95
Deutsch Direkti (Book only)	£5.95
DNFS Instruction Booklet	£2
DISC FILING SYSTEM (DFS) Operating Manual for BBC	£6.95
File Handling on BBC Micro	£8.50
FORTH – Advanced	£9.95
FORTH on the BBC Micro	£9.95
Hackers Handbook - New	£6.95
Hitch-Hikers Guide to A.I.	£8.95
Introduction to COMAL	£9.50
Inside Information, Computers & Coms.	£9.95
ISO-PASCAL Reference Manual	£9.95
LISP the Language of Artificial Intelligence	£13.95
Logo on the BBC Micro	£7.50
Mysteries of DISC DRIVES and DFS REVEALED	**£5.95**
Mastering Assembly Code	£8.95
Mastering Interpreters & Compilers	£14.95
Mastering Music	£6.95
Mastering the Disc Drive	£7.95
Master 512 Guide – Dabs	£9.95
Master Operating System	£12.95
Master Reference Manual Part 1	£14.00
Master Reference Manual Part 2	£14.00
Master Reference Manual – Advanced	£19
Mathematical Prog. in BBC Basic	£7.95
MINI OFFICE II – A Dabhand Guide	£9.95
PASCAL – Introduction to	£17.95
PASCAL Programming	£9.45
Practical Disc File Techniques	£5.95
The Epson FX-KAGA PRINTER Commands REVEALED	**£5.95**
The Software Business	£5.50
Towers Int. Transistor Selectors	£14.95
Understanding Interword – A Beginners Guide	£6.50
Using DOS+ on the 1512 (95% Ok for 512 Bd)	£9.95
View 3.0 User Guide	£10
View Guide (View 2.1)	£4.50
Viewsheet & Viewstore Dabhand Guide	£12.95
Mastering View, Viewsheet & Viewstore	£12.95
VIEW Dabhand Guide	£12.95
Viewsheet User Guide	£10
Viewstore User Guide	£10
Writing Interactive Interpreters & Compilers	£8.45
Wordwise + A User Guide	£9.95
Z88 Computing	£9.95
Z88 Using Your	£9.95

Carriage on Books vary between £1 to £3.50, depending on their weight.

BOOKS for IBM PC & Compatibles

1-2-3 For Business 2nd Edition	£20.95
1-2-3 Command Language	£19.95
1-2-3 Special Edition (QUE) – Using	£21.95
8086/8088 Assembly Language Prog.	£12.45
8086/8088 Programming the	£17.95
Ability – Using	£12.95
Accountancy software in Business – Using	£12.95
Advance C Tech & Application	£19.95
Advanced Tech. in Turbo Pascal	£19.95
Aldus Pagemaker – Using	£21.45
Amstrad Basic 2 Manuals	£12.95
Amstrad Technical Manual for 1640	£19.95
Amstrad PC Programmers Ref Guide	£7.50
Amstrad PC1512-1640 Step by Step – Using	£8.50
Autocad – Using Release 10	£26.95
Business companion on the 1640	£12.95
dBase II & III – Understanding	£7.95
dBase II – Working with	£9.95
dBase III – Mastering	£21.95
dBase III Plus	£12.95
dBase III Plus – Complete Reference	£19.95
dBase III Plus – Mastering	£21.95
dBase III Plus Handbook 2nd Edition	£20.95
dBase III Plus – tips, tricks and traps (QUE)	£19.95
dBase III Plus – Quick Ref. Guide	£4.95
dBase III Plus – Quick Prog. Guide	£8.95
dBase Instant Reference (III & III+)	£10.95
dBase IV – Handbook £19.95	
dBase 4 – Understanding	£22.95
DOS Instant Reference (up to 3.3)	£10.95
DOS, Mastering for Versions up to 3.3	£19.95
DOS Power Tools (includes a disk)	£39.95
DOS Plus Manual/Amstrad PC	£10.95
Excel IBM Version – Using the	£22.95
Good Software Guide – for IBM PCs and Compatibles	£19.95
Hard Disc Instant Reference	£10.95
Hard Disk Manage IBM PC XT AT	£17.35
Hard Disc – Managing your 2nd Ed.	£20.95
Hard Disc management – Quick Reference Guide to	£4.95
IBM PS/2 Handbook	£19.95
IBM PC AT – Inside the	£20.95
Local Area Networks 2nd Generation	£19.95
Lotus 1-2-3 Desktop Companion Soft/B	£24.95
Lotus 1-2-3 – Illustrated	£18.45
Mastering 1-2-3 2nd Edition	£19.95
MS-DOS – ABC's of	£16.95
MS-DOS Advanced Programming	£20.95
MS-DOS Handbook 3rd Edition	£18.95
MS-DOS Instant Reference Guide	£10.95
MS/PC DOS 3.3 – Illustrated	£18.45
MS-DOS Masters – Tricks of	£22.50
MS-DOS Performance Programming Under	£18.95
MS-DOS Quick Prog Ref Guide	£8.95
MS-DOS Quick Reference Guide	£4.95
MS-DOS – Running 4th edition	£19.95
MS-DOS – Supercharging 2nd Edition	£17.95
MS-DOS Users Guide 3rd Edition	£20.95
MS-DOS – Using	£19.95
Operating the IBM PC Network	£18.45
Pagemaker – Desktop Publishing	£15.95
Pagemaker IBM PC – Mastering	£18.95
Pagemaker – Illustrated	£18.45
Programming Guide to EGA & VGA Cards	£20.95
Prog. Guide to IBM – P. Norton's	£19.95
Quattro – Mastering	£21.95
Smart – Using	£21.45
Smart – tips, tricks and traps (QUE)	£22.45
SuperCalc 4 – Mastering	£19.95
SuperCalc 4 – Using	£19.95
Symphony 4th Edition – Mastering	£24.95
The Good Software Guide – for IBM PCs and Compatibles	£19.95
Turbo Pascal Complete Ver. 4.0	£21.45
Turbo Pascal Program Library	£14.95
Upgrading & Repairing PC's	£22.95
Using DOS+ on the 1512 (95% OK for 512 Ed)	£9.95
Using Microsoft WORD 2nd Edition	£19.95
Using Pagemaker on the IBM PC	£22.45
Ventura – Mastering	£21.95
Ventura Publishing – Instant incl. DISC	£34.75
Ventura Tips + Tricks	£18.95
Wordperfect Desktop Companion	£20.95
Wordperfect – Illustrated	£18.45
Wordperfect 3rd Ed – Using	£19.95
Wordperfect Made Easy	£15.95
Wordstar & CP/M made easy	£10.95
WordStar Release 5.0 – Mastering	£19.95
WordStar 1512/1640 – Using	£9.95
WordStar User's Ref. manual	£12.50
Wordstar – Quick program Ref. Guide	£8.95
WordStar 4.0 – Using 2nd Edition	£18.45
Xerox Ventura – Desktop Publishing	£14.50
Xerox Ventura Publishing – Inside	£18.45

NEW

The Advanced Reference Manual for the BBC Master

At last Acorn's long awaited Advance Reference Manual for the BBC Master Series of Microcomputers has now been published. Watford Electronics' own authors have edited and added missing sections to the original script and produced a very high quality publication.

It features information about:

- Memory Organisation
- Slow data bus
- Detailed circuit description
- Keyboard controller
- Screen display
- User port
- Serial Processor
- Peripheral bus controller
- 1 Mhz Bus
- Machine operating System
- Second processors – Internal, Z80 and 80186
- Disc Filing Systems
- ANFS
- Terminal Emulator & Editor
- View internal format
- Detailed differences between Model B, B+, Master 128K and Compact
- Comprehensive appendix on 65C12 instruction set

At the rear of the manual there are pull out circuit diagrams for the Master 128K.
A worth-while addition to any Master owner's library.

All this for just £17 (NO VAT)

NEW

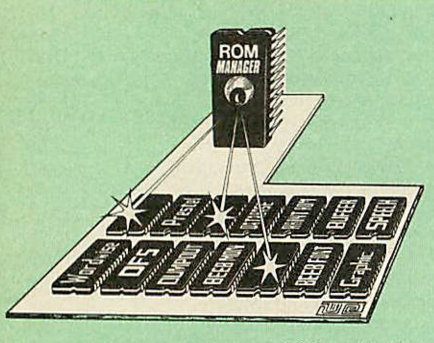
The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.
It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)
Example programs on Disc £4.95

Continued


ROM MANAGER

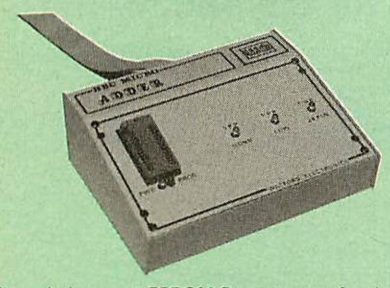


Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs. Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.

"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

ONLY £20

ADDER



The only low cost EPROM Programmer for the BBC Micro that will program both the standard 21V and the new 12V5, 27128 EPROMS.

Adder is the ultimate EPROM programmer for the BBC Micro. It will program many different EPROMs up to the very latest 27256 32K devices.

The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled.

The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.

Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra effort.
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: From 2K to 32K: 2516, 2716, 2532, 2732, 2764, 2764A, 27128, 27128A, 27256 (Both 12.5V and 21V).

£72 (£5 Carr)

TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs! The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast. We use these erasers for all our own erasing work.

- **ERASER EB** – Standard version erases up to 16 chips. **£28** (carr £2)
- **ERASER GT** – Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£30** (carr £2)
- Spare UV tubes. **£9**

Servisol Foam Cleaner

This 415MI, king size multi-purpose foam cleaner spray is ideal for cleaning the Keyboard, Monitor, Disc Drive and your computer furniture surfaces. Simply spray on the surface to clean and wipe off with a clean cloth.

£2.50

SPARES for BBC Micro

BBC Keyboard	£42	Speaker	£2
Master Keyboard	£62	Keyswitch	£1.50
UHF Modulator	£4	16MHz Crystal	£4
Speaker Grill	£1	32.768MHz Xtal	£1.00
Power Supply	£56	Master PSU	£59
BBC Casing	£20		

Replacement FLEXIBLE 17 way Keyboard Connector £4

Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

£2.50

Aerosol Dust Spray

Aerosol Dust Spray

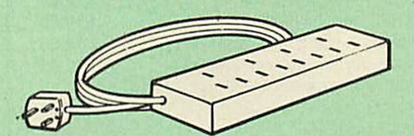
This simple to use aerosol spray is ideal for removing Dust and Dirt deposits from the Keyboards and similar inaccessible places. £3

SURGE PROTECTOR Plug

Fitted in place of your normal mains plug, this device protects your equipment against mains surges. Nearby lightning strikes, thermostats switching and many other sources which put high voltage transient spikes on to the mains. This can lead to data corruption in memory and on disc and can result in spuriously crashing machines. A must for every computer user.

Protection for only **£7.50**

4 WAY MAINS DISTRIBUTION SOCKET



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

£7.95 (carr £1.50)

ARIES SPIKE CLEANER UNIT

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete computer system

£13.00 (carr. £1.50)

ROM EXTRACTION TOOL

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

£2

28pin DIL HEADER PLUG

SOLDER type **£1.50**; IDC CRIMP type **£1.95**

8 WAY DIP SWITCH

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ Keyboard.

Only **£1.00**

28 pin ZIF SOCKET (Textool) £6.95



Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK £8

CONNECTING LEADS

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	
to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
to 3 Jack Plugs	£2.50
6 pin DIN to 6 pin DIN Plug (RGB)	**£3.00**

DISC DRIVE POWER LEADS

Supply from BBC power supply to standard Disc Drive connector.

Single **£3.00** Dual **£3.75**

DISC DRIVE INTERFACE LEADS

BBC to Disc Drives Ribbon Cable

Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

CHIP SHOP

DS3691	£4.50
DS88LS120	£5.25
LM324	£0.45
SN76489	£5.50
SAA5050	£8.75
UPD7002	£6.00
2764-250nS	£2.80
27128A-250nS (12V5)	£3.00
27128-250nS (21V)	£5.25
27256-2	£3.99
27512-2	£7.99
27C101G (1 Meg)	£13.95
4013	60p
4020	£0.90
4164-15	£3.25
4464-12	£8.95
4464-15	£8.25
4816 RAM	£2.00
41256-15	£8.25
41256-12	£9.75
6264LP-8K	£6.00
6502A CPU	£4.50
65C02 3M	£9.75
65C12	£9.00
6512A	£10.00
6522	£3.40
6522A	£4.50
62256ALS-15	£12.50
6818	£4.00
6845SP	£6.00
68B50	£2.95
68B54	£7.50
7438	40p
74LS00	25p
74LS04	25p
74LS10	25p
74LS123	80p
74LS163	70p
74LS244	80p
74LS245	£1.00
74ALS245	£2.75
74LS373	£1.00
74LS393	£1.00
75453	70p
75159	£2.00
8271	£39
9637	£2.00
ICL7673PA	£2.00

ASSORTED ROMS

ACORN ADFS	£25
ACORN BASIC 2 plus User Guide	£22
Acorn BCPL	£42
Acorn COMAL	£38
ACORN DNFS	£17
Acorn FORTH	£32
Acorn Graphics	£25
Acornsoft C Disc	£45
Acorn LISP	£19
Acorn LOGO	£42
Acorn OS B+	£25
Acorn OS 1.2	£14
Basic Editor	£24
BBC PCB Designer	£49
Beebfont	£25
Beebmon	£22
BROM Plus	£32
Buffer & Backup	£20
Communicator	£49
Commstar II	£28
EPSON NLQ ROM	£25
Graphics Extension Rom GXR-B	£21
GXR-B+	£22
Help II	£27
ISO Pascal	£51
ISO-Pascal Stand Alone Generator	£30
ICON Master	£28
Logotron LOGO	£39
Master OS ROM	£38
Master Termulator	£32
Micro Prolog	£62
Microtext Disc	£46
Microtext Rom	£199
MUROM	£21
NLQ DESIGNER	£25
Pendown ROM	£29
ROMIT	£29
Serial ULA	£13
TED	£35
Termulator B, B+	£25
Termulator Master	£32
Toolkit Plus B, B+	£31
Video ULA	£14
ULTRACALC II	£26
1Mb OS ROM	£39

Now for a touch of FINESSE when you choose an Aries PC from Watford

FREE... Hardware and Software worth £300, with every Aries PC System purchased from us

The Aries IBM PC-XT 88 and Aries PC AT286 compatibles are now supplied with Digital Research's GEM, the powerful Finesse 1.1, Desk Top Publishing package and Multiwriter WORDPROCESSING software, (in addition to PC Organiser, MSDOS and 12 months on site maintenance warranty). So not only you get the best all round value in PC compatibles, but you also get a complete and powerful WYSIWYG DTP software package that takes you from typewritten text onto typeset quality layouts. LOGITEK MOUSE too is included with the package.

WATFORD GIVES YOU MORE FOR YOUR MONEY.

P.S. To operate Finesse DTP, you require a Hard disc system.

ARIES PC-XT 88



Specification:

- 16 Bit Intel 8088-2 or NEC V20 78108 microprocessor, running at 8MHz or 4.77MHz. (3 times faster than IBM PC/XT).
- 8087-2 maths co-processor, optional.
- 640K minimum expandable to 1024K on system board, extra 384K RAMDISK available.
- 360K Single Floppy (optional 2nd Floppy/3.5"/20MB Winny/T. Streamer).
- CLOCK on System board, gives non stop DATE & TIME.
- 8 expansion slots.
- 102 keys keyboard.
- RS232 with two ports.
- 150W power supply.
- Microsoft MS DOS 3.30.
- GW-BASIC 3.21.
- Mono graphics/parallel card.
- Legal BIOS and built in games port and clock.

ARIES PC AT286



Specification:

- 80286 microprocessor.
- Optional 80287 Maths co-processor
- 640K RAM standard expandable on-board to 4MB.
- 1.2M Single Floppy (optional 2nd Floppy/3.5"/Winny/T. Streamer)
- CLOCK on System board, gives non stop DATE & TIME.
- 8 expansion slots.
- 102 key keyboard.
- Serial/Parallel Card.
- HDD/FDD Card.
- Switchable Speed 8/12M Landmark test at 16MHz.
- 200W power supply.
- Microsoft MS DOS 3.30.
- GW-BASIC 3.21.
- Mono graphics/parallel card (Herc. Compt.)
- Slide in metal case with function display.
- Legal BIOS and built in games port and clock.

FREE 12 month On-site Maintenance warranty (UK mainland) included in the price

Aries PC-XT 88 – Available in the following configurations:

- ***System 1*** *– Aries PC-XT 88 Basic System including FREE Bundled Software & Hardware* ***£445***
- ***System 2*** *– Aries PC-XT 88 system 1 as above plus 14" hi-res monochrome Flat Screen monitor* ***£489***
- ***System 3*** *– Aries PC-XT 88 System 2 as above plus a 720K 3.5" Disc Drive fitted* ***£579***
- ***System 4*** *– Aries PC-XT 88 System 2 plus a 20MB Hard Disk fitted* ***£799***
- ***System 5*** *– Aries PC-XT 88 System 2 plus a 40MB Hard Disk fitted* ***£849***
- **System 6** – Aries PC-XT 88/EGA hi-res Colour System, Aries EGA Monitor/EGA Card and 40MB Hard Drive fitted. **£999**
- **System 7** – Aries PC-XT 88 System 5 plus Ultra High Res VGA/Multisync Colour Monitor & Card plus 40MB Hard Disc Drive fitted **£1149**

Aries PC AT286 – Available in the following configurations:

- ***System 1*** *– Aries PC-AT 286 Basic System including FREE Bundled Software & Hardware* ***£759***
- ***System 2*** *– Aries PC-AT 286 system 1 as above plus 14" hi-res monochrome Flat Screen monitor* ***£799***
- ***System 3*** *– Aries PC-AT 286 System 2 as above plus a 720K 3.5" Disc Drive fitted* ***£889***
- ***System 4*** *– Aries PC-AT 286 System 2 plus a 20MB Hard Disk fitted* ***£995***
- ***System 5*** *– Aries PC-AT 286 System 2 plus a 40MB Hard Disk fitted* ***£1199***
- **System 6** – Aries PC-AT 286 / EGA hi-res Colour System, Aries EGA Monitor/EGA Card & 40MB Hard Drive fitted. **£1399**
- **System 7** – Aries PC-AT 286, Ultra High Res VGA/ Multisync Colour Monitor & Card plus 40MB Hard Disc Drive fitted **£1499**

FREE £300 worth of Hardware & Software with every Aries PC puchase from us this month.

Prices subject to change without notice and available on request. ALL OFFERS subject to availibility.
Mail Order and RETAIL SHOP. Trade and Export inquiries welcome. Government and Educational Establishments' OFFICIAL ORDERS Accepted.
Shop Hours: 9.00am to 6.00pm. Monday to Saturday. Thursdays 9am to 8pm. (Free Customer's Car Park)

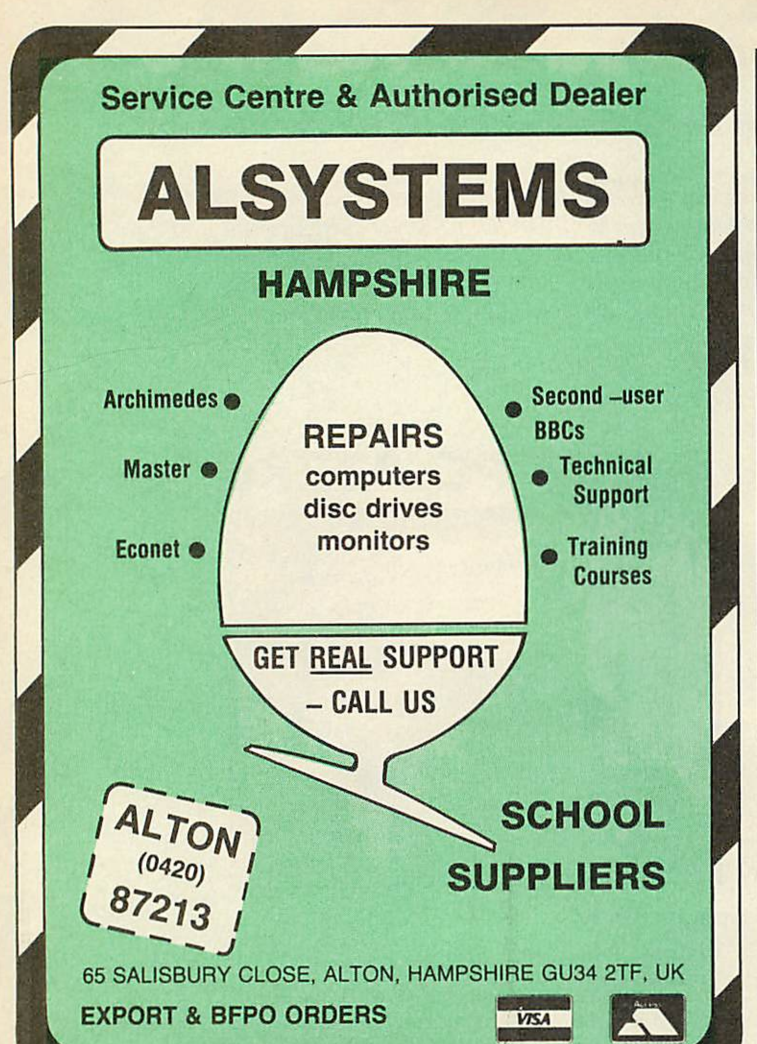
VAT: UK customers please add 15% VAT to cost incl. Carriage.
CARRIAGE: Unless stated otherwise, minimum £1.50 on all orders. £3 on Larger items. On bulkier items, £7 Securicor charge applies (UK mainland only). Overseas orders, carriage is charged at cost.

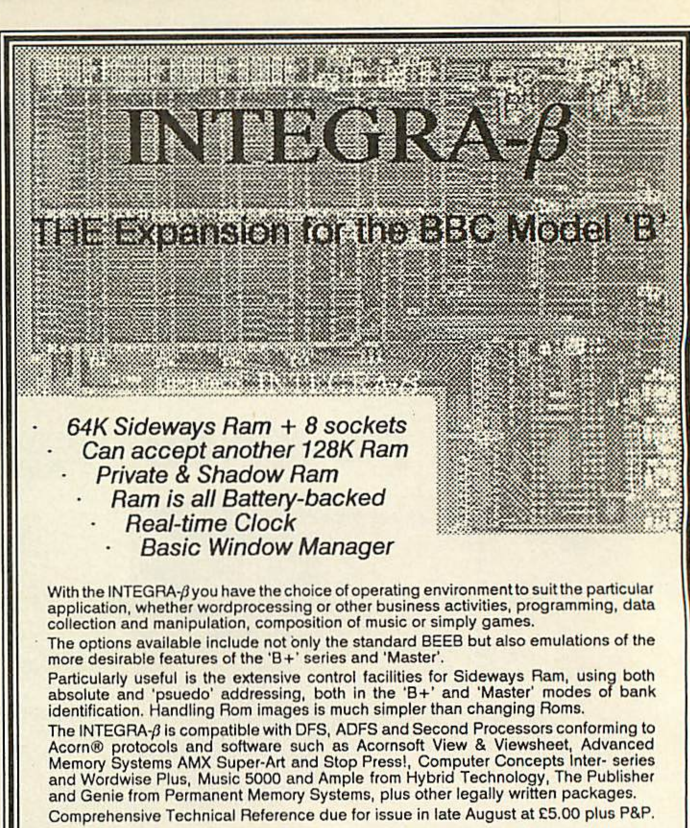
Specifications of all products are given in good faith but is subject to change without notice. Some items vary in their availability. Please ring for latest delivery situation.

Watford Electronics

JESSA HOUSE, 250 Lower High Street,
WATFORD WD1 2AN, ENGLAND
Telephone: (0923) 37774; Telex: 8956095;
FAX: 01 950 8989

ORDER VIA MicroLink 72:MAG030

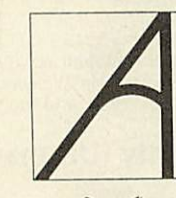




Offer Prices	UK (Incl. P&P, Ins.)	Only (P&P)	Europe (Plus P&P, Ins.)	Only (P&P)	Others (Plus P&P, Ins)
INTEGRA-β	£135.00		£124.00		£120.00
32K Ram Chip	£16.00	£1.00	£14.00	£2.00	£14.00
W.P. Switch Box (2 fitted of 6)	£7.00	£1.50	£8.00	£3.00	£7.00
Extra Switch Unit	£1.50	£1.00	£1.50	£2.00	£1.50
Rockwell 65C02 CPU	£8.75	£1.00	£8.75	£2.00	£8.75

COMPUTECH
2, Belle Isle Terrace, Main Street, Grange over Sands, Cumbria. LA11 6AE
Telephone: 05395 34604

FREE



with every computer we sell...



...our expertise!

If you are buying a new Archimedes or Master Series computer, you don't expect to know all about it from day one. That's where we come in. We don't leave our customers high and dry with their problems — they know they can rely on us to get them out of trouble. Whether it's hardware or software, we're the people who know.

THE DATA STORE

6 Chatterton Road, Bromley, Kent
Tel: 01 460 8991 Fax: 01 313 0400

An old-fashioned *specialist* computer shop



Archimedes PRODUCTS FOR THE 1990's

NEW PRESENTER STORY

The ultimate in Business Presentation software. Turn your Archimedes into a tool to project combined images of Text, Logos, Graphs, Digitised & Video Pictures to illustrate your presentations more clearly. Many special screen features are included such as vertical and smooth scrolling and bouncing. It can be used with most makes of RGB projectors or you can use your Archimedes monitor for smaller Presentations. PRESENTER STORY is available for Business applications now. Education and Media/Video versions will be available soon. RISCOS compatible.
£199.00 + VAT

PRESENTER

The established presentation package for Archimedes users in schools and businesses alike. Colour 3-D Bar-, Line- and Pie- charts and graphs can be made quickly and easily in the Acorn WIMP environment. These charts and graphs can be printed on FX-compatible and Integrex colour printers and also on Plotmate plotter. Alternatively, they can be ported into other packages, such as 1st Word Plus, Artisan & Graphic Writer. RISCOS compatible.
£24.95 + VAT

NEW CONTROL PANEL

*Confused about the *Configure comands? With Control Panel there is no need to worry. Use Control Panel to set the right Archimedes* configuration for all your application software. You can then Save and Load the configuration settings of your choice for use at later dates. Control Panel also includes a utility to build configuration files into program boot files. Fully wimp-driven with constant real-time help screen.*
£14.95 + VAT

NEW COLOUR CONVERTER

Do you want to capture colour images onto your Archimedes screen? The Colour Converter podule running with the Watford Digitiser allows full colour images to be captured and saved as screens or sprites. The package also includes new Dithering Software which will give you greatly enhanced near-television quality pictures, using an effective palette of 256,000 colours! The Colour Converter ½ Width Podule and Software is available now.
£169.95 + VAT

NEW AIM (Archimedes Image Manager)

Public Domain Image Processing software from Delft University which will increase the contrast and sharpen blurred images that have been digitised. Many varied uses—in education, industry and the home. A multisync monitor is required in order to give the necessary resolution
£9.00 + VAT

See us at the BBC ACORN USER show on Stand 39

VISA and ACCESS accepted.

All Lingenuity products are available direct or from good Acorn dealers.
Educational discounts and site-licences are available.
For further details please contact us on 098 685 477 or write to Lingenuity, PO Box 10, Halesworth, Suffolk IP19 0DX.

OFFERS

TRIVIAL PURSUIT

Three for the price of one

This month's reader offer is far from trivial. From as little as £14.95 you can have the following Trivial Pursuit games, *Genius, Baby Boomer* and *Young Persons.* All three for the price of one.

Trivial Pursuit the computer game is very faithful to the original board game. The basic idea is for the players to travel around the board answering questions and trying to collect a wedge for each of the six subjects. The questions are asked by TP, a cute character who presents his congratulations if you answer the questions correctly or his deepest commiserations if you don't.

The screen layout is very similar to the board game with a chart showing the wedges of each player. Don't worry about running out of questions – there are spare blocks on a second cassette or disc. One feature of this marvellous family game is that there is a score board which keeps track of each player's performance and it can be consulted throughout the game. Send off today and you will receive bags of fun for all the family with this most popular game.

Please send me

☐ Trivial Pursuit, Genius, Baby Boomers and Young Players **on cassette at £14.95.**

☐ Trivial Pursuit, Genius, Baby Boomer and Young Players **on 5.25in disc at £19.95.**

I enclose my cheque for £

Please charge my Access/Barclaycard Number ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

EXPIRY DATE ☐☐☐☐

NAME ____________________

ADDRESS ____________________

____

____________________ POSTCODE ____________

SIGNED ____________________ DATE ____________

Please send this coupon with your remittance to **Trivial Pursuits Offer,** ***BBC*** **Acorn User Merchandising, 20-26 Brunswick Place, London N 1 6DJ.**

"Trivial Pursuit is a Trade Mark owned and licensed by Horn Abbot International Ltd"



STARS IN MOTION

Crash galaxies together on the screen of your micro to learn the mysteries of the heavens

Andrew Rankin

Have you ever gazed at the stars at night and wondered at the forces that shape the universe? Now you can experiment with the stars on your computer.

Although the stars appear to be scattered at random across the sky, in fact they tend to occur in clusters which themselves are members of larger and larger formations, until they reach the scale of galaxies of billions of stars.

The sun is situated on the outer edge of our galaxy. On a clear night, if you look overhead you will see a myriad of stars stretched across the sky in a wavy band, like a stream of milk. Hence the name 'Milky Way'.

Astronomers have been studying the heavens since ancient times and now know that the apparently stationary stars are actually drifting in space.

The stars are rotating about the centre of the galaxy like a gigantic spinning top, and the galaxy itself is moving relative to other nearby galaxies.

It is difficult to determine exactly how the stars move within galaxies as we are basing our knowledge on a span of a hundred years or so of photographic evidence, or at most several hundred years of observations. This is very short on the astronomical time-scale – one revolution of the Sun around our own galaxy will take about 250 million years!

Colliding galaxies

The many forms which galaxies take can be divided into three main classes: 'Elliptical' which have no evident internal structure, those with a central core surrounded by a thin disc with trailing spiral arms, which are 'Spiral' and the most common (75 per cent), and those which do not fit into either group and are classified as 'Irregular'.



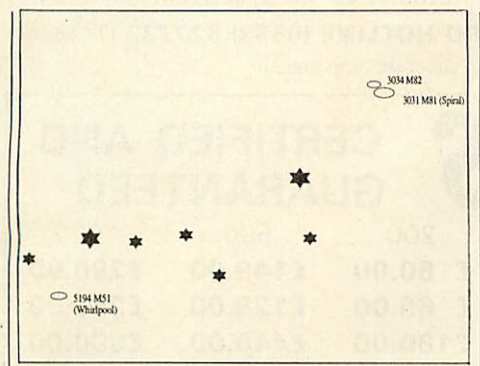
ILLUSTRATION BY BOB MURDOCH

There has been much conjecture about how these forms have arisen and whether galaxies can change from one form to another, possibly as a result of passing close to or colliding with another galaxy.

There are many examples of galaxies which appear to be interacting in this way, exerting gravitational influence on each other's stars. The Whirlpool Galaxy (NGC 5194 and NGC 5195) and the similar pair, NGC 7752 and NGC 7753, are spiral with an arm connecting the two galaxies. The Toadstool Galaxy has a bridge structure connecting the two nuclei made from material drawn out from either galaxy and in which new stars are forming.

The Cartwheel Galaxy is an example of a ring formation probably caused by a head on collision, and then there is the strange Antennae Galaxy (NGC 4038 and NGC 4039) which has two filaments arching outwards from the main stellar discs giving the appearance of an insect's head. They could have arisen by the galaxies approaching each other at approximately the right velocity and separation to orbit each other, throwing off two streams of stars.

If you have a pair of reasonable binoculars (at least 7x magnification and 50mm objective lens) you can observe the Whirlpool Galaxy as two bright cores surrounding a luminous halo close to Eta Ursa Major (the first star in the handle of the Plough). While you have the binoculars out, in the same part of the sky you can also see a spiral galaxy, M51 at the opposite end of this constellation.



Galaxies visible with binoculars

The problem

The interaction of two galaxies is an extremely complex subject. The galaxies are constantly evolving throughout the interaction, the theory of which is still not complete.

A galaxy may contain 100,000,000,000 stars at various stages of development and will probably have a complicated magnetic field as well.

To complicate matters further, galaxies are sometimes thought to centre on a massive black hole. Additionally, (contrary to popular belief) space itself is not empty but actually contains a significant amount of material thinly spread out and possibly moving.

We can apply the laws of physics to this situation to formulate theories of galactic structural change and we can use computer processing to speed up the many calculations involved but how is it possible to track the motion of billions of stars in such a convoluted problem?

The answer is of course, simple. Just use a computer simulation in which only the essential features of the colliding galaxies are represented.

This solution allows theories under development to be tested, which would otherwise be impossible. Early simulations used mainframe computers but nowadays modern microcomputers have advanced sufficiently to allow us to build a model of sufficient detail, albeit on a reduced scale, on a Master.

The computer model

In this simulation, the first simplification is to exclude all forces other than gravity – as indeed do most other computer models of this problem. Secondly, it is believed that less than 10 per cent of a galaxy's total mass is in the disc with the bulk of its mass contained in the nucleus (or distributed throughout the galaxy as dark matter) so we can ignore the gravitational forces due to the disc stars.

HOW IT WORKS

The force of gravity is described by:

$$\text{force} = \frac{\text{constant x mass A x mass B}}{(\text{distance between A and B})^2}$$

In this program a small value is always added to the separation to prevent the denominator becoming zero. So the gravitational constant is equal to one, time is in units of 1.2 million years, distance in 500 parsecs (1600 light years) and mass in units of 20,000 million solar masses.

The solution of the equation of motion of each star is achieved by breaking down the movement into a series of time steps.

At the beginning of each step, the position of each star is known and the force due to the two galactic centres can be obtained using the equation which is shown above.

As the star moves, this force will vary as the distance to the galactic nuclei changes. To simplification, the force is fixed at its initial value throughout the time step. Using Newton's Second Law:

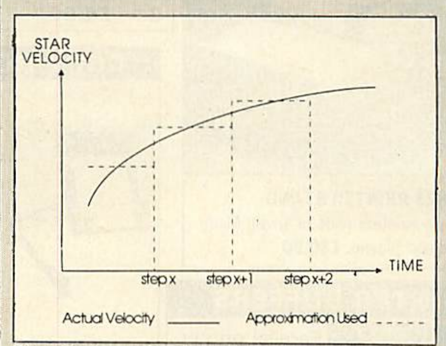
force = mass * acceleration

the acceleration (also fixed) can be derived. To determine the new position of the star, the velocity is fixed at the value occurring half way through the current time interval. The velocity is calculated from:

new velocity = old velocity + acceleration x time step

The new position is then derived from the fixed velocity by:

new position = old position + new velocity * time step



Simplifying velocity calculations

Finally, the centres of the two galaxies are moved using the same method and the whole cycle is repeated. This results in a simple algorithm which can be processed rapidly.

These peripheral stars move under the influence of the two central cores only and trace out the gravitational field of the combined system. Paradoxically, more sophisticated models, which include the gravitational forces due to individual stars, produce less convincing results.

It is not practical to represent billions of stars on a micro. So in our model we have decided to use hundreds of points which each effectively take the place of a billion stars.

This procedure makes running the simulation within the confines of memory and reasonable processing time possible, yet it also manages to present reasonable detail of the interaction.

The model consists of a target galaxy made up of a disc of stars in circular orbit round a central core and a passing intruder galaxy represented only by its nucleus. The target is 15,000 parsecs wide and contains 100 billion star masses which is in the range observed for this type of galaxy (SO Spiral – which is disc shaped with no spiral arms).

The problem reduces to calculating the positions of the two galactic centres and the target galaxy stars in their combined gravitational field.

Running the simulation

The simulation begins with the setup screen and you are prompted to input the initial parameters for the two colliding galaxies. You will note that the number of stars are distributed around the target galaxy in rings.

While experimenting it is advisable to use relatively few stars (say, four rings of 10 stars) to see the effects of your parameters so the processing will be as fast as possible. When you are satisfied you have an interesting situation, use several hundred stars for a detailed view.

The intruder galaxy's mass is entered as a percentage of the target galaxy mass so typing 100 will provide two equally massive nuclei. The position and velocity are specified in Cartesian co-ordinates (X,Y,Z) relative to the target galaxy at the origin (0,0,0).

The separation must be in the range 70 to -70 distance units in the X and Y directions and 35 to -35 in the Z direction to fit on the screen. The Z distance limits are smaller because this axis is magnified to give a clearer picture of events. Try entering X=7.5, Y=0, Z=35 for the distances.

The velocity components chosen

COMPUTER · SUPPLIES AND ACCESSORIES

OMD
OVERSEAS MEDIA DISTRIBUTORS LTD

see us at the BBC ACORN user show '89

MINIMUM ORDER VALUE £7.50

BUY DIRECT FROM DISTRIBUTORS AND IMPORTERS.
PRICES FULLY INCLUSIVE OF VAT & DELIVERY (UK ONLY)
CREDIT CARD HOTLINE (0533) 877733 (24 hours)
PERSONAL CALLERS WELCOME 9.30-5.00 pm

TOP QUALITY BULK DISKS CERTIFIED AND GUARANTEED

5¼"

	50	100	200	500	1000
DSDD 40/48 TPI	£23.50	£31.50	£ 60.00	£149.00	£290.00
DSDD 80/96 TPI	£24.90	£33.50	£ 65.00	£128.00	£250.00
DSHD AT DISK	£49.50	£95.00	£180.00	£440.00	£800.00
COLURED DSDD 40/48 TPI	£30.50	£55.00	£100.00	£240.00	£450.00

RED, BLUE, GREEN, YELLOW, WHITE.
Supplied with Envelopes, Labels and Write Protectors

3½"

	25	50	100	200	500
DSDD 135 TPI	£29.50	£49.00	£ 89.90	£175.00	£375.00
COLOURED DSDD 135 TPI	£39.50	£74.50	£140.00	£260.00	£550.00

Quality Disks supplied with Labels

PRINTER RIBBONS

Amstrad 8256/LQ3500	£3.90	NEC P2200	£4.50
Amstrad DMP 2000/3160	£2.75	Panasonic KXP 1081	£4.50
Amstrad DMP 4000	£4.50	Star NL10	£3.90
Citizen 120D	£4.25	Star LC10	£3.90
Canon PW 1080	£4.25	Star LC10 Colour	£7.90
Epson LQ 800	£3.90	Star LC24-10	£4.50
Epson LX 80/86	£2.90	Shinwa CP 80 MS	£4.50
Epson MX/FX/RX80/FX/LX800	£2.90		

Most other makes of Printers Ribbons available, please call for prices.
Dust covers for above **£4.50**

▲▽▲▽ FREE △▼△▼

100 CAP. LOCKABLE DISK BOX WITH EVERY **BULK DISK** ORDER

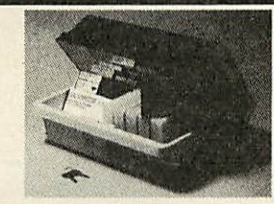
DATA SWITCH BOX



Available in RS232 or Centronics

2-Way	£19.50	4-Way	£25.50
3-Way	£22.50	Cross Over	£27.50

DISK STORAGE BOXES



5¼"	50	£6.90
5¼"	100	£7.90
5¼"	140	£9.90
3½"	50	£6.75
3½"	100	£8.90

All Storage Boxes are with Lock and come with 2 Keys

DOT MATRIX PRINTERS (FREE CABLE)

Citizen 120D	£139.00	Star LC10-24	£349.00
Panasonic KXP 1081	£179.00	Epson FX850	£370.00
Panasonic KXP 1124	£339.00	Epson LX800	£199.00
Star LC10	£199.00	NEC P2200	£329.00
Star LC10 Col	£259.00		

COMPUTER PAPER

PLAIN FANFOLD PERF. EDGES
11 × 9½" 60 gsm 2000 **£16.90**
A4 11⅔ × 9¼" 85 gsm 1000 **£14.90**

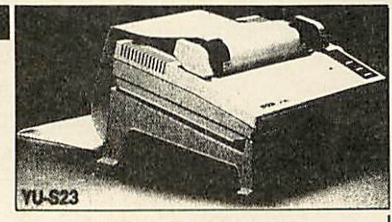
COMPUTER LABELS

SELF ADHESIVE, CONTINUOUS
PACKED 2000 1, 2 or 3 across
3½ × 1⁷⁄₁₆" **£10.90**
4 × 1¹⁄₁₆" **£11.90**

PRINTER STANDS



YU-S25 K/D PRINTER STAND
Made of molded plastic. Feeds and refolds paper underneath the printer, takes up hardly more space than the printer itself
YU-S25A: for 80 col. printer. **£27.90**
YU-S25B: for 132 col. printer. **£32.50**



YU-S23 PRINTER STAND
Securely holds any printers wide or small. Made of molded plastic. **£10.50**

DISK HEAD CLEANER WITH FLUID

3" **£4.50** 3½" **£3.50** 5¼" **£2.75**

COPY HOLDERS



With adjustable arm
80 Column **£14.50**
132 Column **£19.50**
Desk Top **£8.90**

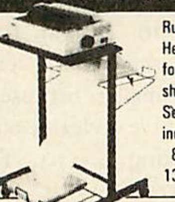
SUPER MOUSE PAD

11" × 9" HIGH QUALITY MOUSE PAD WITH NON SLIP RUBBERISED BACKING **£4.90**



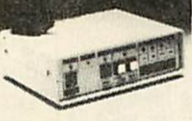
OVERSEAS MEDIA DISTRIBUTORS LTD
OM HOUSE,
139-141 DOMINION ROAD
GLENFIELD, LEICESTER LE3 8JB
TEL: (0533) 877733 (24 hours)
FAX: (0533) 873999
ORDER BEFORE 12 noon FOR SAME DAY DESPATCH
EDUCATIONAL, GOVERNMENT AND PLC ORDERS ACCEPTED.
TRADE AND EXPORT ENQUIRIES WELCOME
MINIMUM ACCOUNT ORDER £25.00

MOBILE PRINTER STAND



Rugged steel frame. Height adjustable basket for output paper & base shelf for input paper. Self assembly — includes castors.
80 column **£57.50**
132 column **£74.50**

PRINTER BUFFERS



Parallel printer buffer memory with copy bypass and reset

PB 64K 1 IN 1 OUT	£ 75.00
PB 64K 2 IN 1 OUT	£ 95.00
PB 256K 1 IN 1 OUT	£145.00
PB 256K 1/2 IN 2/1 OUT	£169.00

PRINTER CABLES

IBM PC/Amstrad/Compatible 25 PIN-36 PIN	£7.50
RS232M/M	£8.50
RS232M/F	£8.50
CENTRONICS/CENTRONICS	£8.50

should be less than two units to start with, as you will find this allows time to establish a pattern. Specifying a positive value means the intruder will travel away from the target on this axis, so you should start with something like X=0, Y=0, Z=-1 for the respective velocity components.

You are then presented with an option to run the simulation, alter the parameters or exit the program.

Collisions in progress

Once the simulation is actually under way you will be presented with a new screen showing the parameters you have entered and their current values will be automatically updated during the run. The lower half of the screen shows a pair of two dimensional views of the x-y and x-z planes with the z axis enlarged by a factor of two.

Incidentally, note that the display is upside down compared to the normal Beeb layout. That is, the x-axis is left to right but the y-axis (and z-axis) origin is at the top and increases towards the bottom of your screen.

The target galaxy appears as a central ring surrounded by the specified number of rings of stars and the intruder appears as a solid circle.

The computer will calculate the motions of the tracer stars and the galactic centres and it will then re-display them along with the new parameters and the time step in time units.

If you use the first suggested values, after 50 or so cycles you should have a ring shaped galaxy on your screen. Regardless of the positions of the galaxies the program will attempt to centre the display on the mid point between the two nuclei.

As you watch the nuclei interact and the stars change position you can at any time press P to cause the simulation to pause at the end of the current cycle of calculations and display '...waiting...'.

Pressing G will initiate the graphics dump command installed in PROCdump. If the S or E keys are pressed while the screen is being printed the selection will be enacted there and then, otherwise the option will run immediately after the next cycle of movement.

Pressing S will abort the sequence and return to the set up page ready for another trial and E will exit the program.

The fifth choice is I which enables the user to select the number of time step



A sequence from the program showing a possible mechanism for the formation of spiral galaxies by a close call with a passing galaxy

Mijas Software

Bringing the new software world to YOUR BBC Micro

New Issue of 'A Book on C' by Berry and Meekings £11 inclusive

Now available on the ARCHIMEDES (under emmulation) as well as BBC B and MASTER series

The Better Software Development System For the BBC B, MASTER 128 and COMPACT

Assembler, Linker, Debug, Shell and Small 'C'
New Code Optimiser also available. (see below)

Professional-style assembler, modular, relocatable, disk to disk.
Full Specification Linker giving compact run-files anywhere in memory.
Source-Level Debug for rapid and effective testing of 'C' or assembler.
Full Library facilities, 'C' and assembler Libraries provided (with sources).
★Extended implementation of the original Small C including BBC graphics.
Full Source Code provided for the 'C' compiler, add your own features!
Many times faster than BASIC, 40K+ Program space in stand-alone mode.
Post-sales support, low cost updates.

★ Original Small 'C' code supplied with the development system at the cost of distribution

Complete System for MASTER or BBC B with 64K of s/w RAM Archimedes(emmulation) version now available. Manuals included..

£50 +VAT

Included on 80T disk Small 'C', Assembler, Linker, Shell, Source-Level Debug, Libraries and test programs. Optimiser supplied separately.

New Code Optimiser

Revolutionary new Code Optimiser for Small C. Your programs use LESS memory and run up to THREE TIMES faster than before.
Forget about assembler code and use Mijas Small C for high-speed graphics, text and word processors and many other programs.
This new optimiser does not change your programs, has no restrictions, and makes them run up to 24 times faster than BBC BASIC.
Upgrade from Small C (any issue) £25+vat. Complete system with Small C and optimiser £70+vat.

Other Microprocessors

Development system for the Mitubishi 740 series as well as for the 6502 and 65C12. Supports all the new addressing modes. Mix C and Assembler. Write software for single board computers and other industrial applications using your BBC computer. Price including optimiser £150+VAT.

Write for full details or order today from:-

Mijas Software
Winchester Rd.
Micheldever
Winchester
Hants SO21 3DG

Tel: 0962 89 352





All software available in DFS or ADFS format on 5.25 or 3.5in. Discs.

contex

Archimedes is a trademark of Acorn Computers Ltd.

BANK MANAGER *for disc systems only*
The most advanced and versatile personal bank account management program available for all BBC computers. Consistently acclaimed!
"data entry is a delight . . . professional . . . excellent product" – Micro User April '86
Enter cheques and receipts. Standing orders any frequency. Automatic date sequencing. Reconcile statements. Search, amend and delete. Unreconcile. Move forwards or backwards. Analyse expenditure. Forward cash flow forecast. Up to 36 simultaneous 'bank accounts' online, inter-account transfers. 9999 standing orders. 99 analysis categories. 12 actual and 12 budgets per category, over 4,000 postings on an 80tk disc. Reports to screen or printer. Graphics. Foreign currency support. Password. File recovery. Auto exec file. Field editing. Itemised look ahead. Programmable report writer.
Standard Bank Manager for the BBC B, B+ £17.50

BANK MANAGER MASTER *for disc systems only*
Version 2 now available. Includes all of the facilities of the Standard Bank Manager plus ADFS file system support, shadow screens, uses sideways RAM, 40 or 80 column screen reports, improved graphics, m/c windows, function key support and onscreen labels, additional functions added to the already extensive report facilities.
Bank Manager Master for the MASTER and MASTER COMPACT £22.50

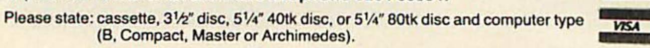
ARCHIMEDES BANK MANAGER
All facilities of Master version plus high speed 'native' mode, wild card analysis enquiry, analysis code sort and other enhancements.
"Impressed, ideal, easy to use" – Micro User, March '88
ARCHIMEDES BANK MANAGER £25.00

BANK MANAGER BUSINESS UTILITIES *for disc systems only*
For the 'professional' who also uses the BANK MANAGER to control the business accounts the BUSINESS UTILITIES add double entry trial balance and programmable spreadsheet analysis reports. Generated from cheque and cash transactions keyed into BANK MANAGER. Just pass the reports to your accountant! Available for all Bank Manager versions, state which.
Bank Manager Business Utility Pack 1 £12.00

TYPING TUTOR
Quickly learn to touch type. Over 90 smoothly graded lessons graduate you from the basic home keys to complete keyboard mastery. Unique word scan line checking. Target WPM and percentage correct. You may revice the targets or lessons as required. Audio key click for positive key depression. Establish a typing rhythm using the automatic metronome. Free format option. Disc version includes several enhancements eg. on screen keyboard, exact mode, on screen parameters. Recommended.
Cassette £12.50, Disc for BBC B, B+, MASTER and COMPACT £12.50
Disc for ARCHIMEDES (all models) £15.00

ALL PRICES FULLY INCLUSIVE FREE POSTAGE WITHIN UK.
Enquiries and Access Credit Card orders **telephone 0234 838347**

Please state: cassette, 3½" disc, 5¼" 40tk disc, or 5¼" 80tk disc and computer type (B, Compact, Master or Archimedes).





EXPANSION CARDS FOR THE ACORN ARCHIMEDES COMPUTER SYSTEM

IEEE488 INTERFACE a full implementation of the standard for automatic test and measurement systems

16 BIT PARALLEL I/O two 16 bit input or output ports with handshake lines for digital control applications

DUAL RS423 SERIAL INTERFACE for communicating with two additional RS423 or RS232 devices eg printers, plotters, instruments, etc

12 BIT ANALOGUE I/O in development

All the above high performance expansion cards are supplied with high level software for ease of use and a comprehensive user guide.
Take advantage of Intelligent Interfaces' expertise and purchase a complete Archimedes Computer System.

Officially appointed Acorn Scientific Dealer.



Intelligent Interfaces Ltd
43b Wood Street
Stratford-upon-Avon
Warwickshire
CV37 6JQ
Tel: 0789 415875
Telex: 312242 MIDTLX G



less of any previous stopping point unless of course you select this option after setting up.

This iterations facility allows you to set up a complex of many time steps, go off and make a cup of coffee and the model will be waiting at the selected point on your return.

The simulation is entirely in Basic 4 so it will run only on the Master, Archimedes or BBC model B with second processor. The unexpanded model B is unsuitable because we are using mode 0 graphics for this project and require reasonably sized arrays to accommodate the stars' parameters.

The program could be converted fairly easily to run under Basic 2 on a model B with shadow Ram by using GOSUB's at line 140 and using the explicit form of VDU command at line 470.

Starting up

It is useful to have some starting parameters to get going with, to make sure you have typed in the program correctly from the yellow pages.

The table shown above gives a selection of values, which you should find useful to be going on with, and also the results you should find appearing on your screen. Obviously, once you have the program working correctly, the most interesting part will, of course, be inserting your own values.

A proper 'Antennae' galaxy interaction cannot be reproduced completely by this program as it requires a set of disc stars around both the target and intruder nuclei. These shear off to form two filaments when the galaxies approach and orbit each other.

Using the starting values in the table and 15 rings of 50 stars, you can obtain a single filament arc of five stars breaking away after about 60 time units – a sort of 'half antenna'. See for yourself if you can improve on this!

FURTHER READING

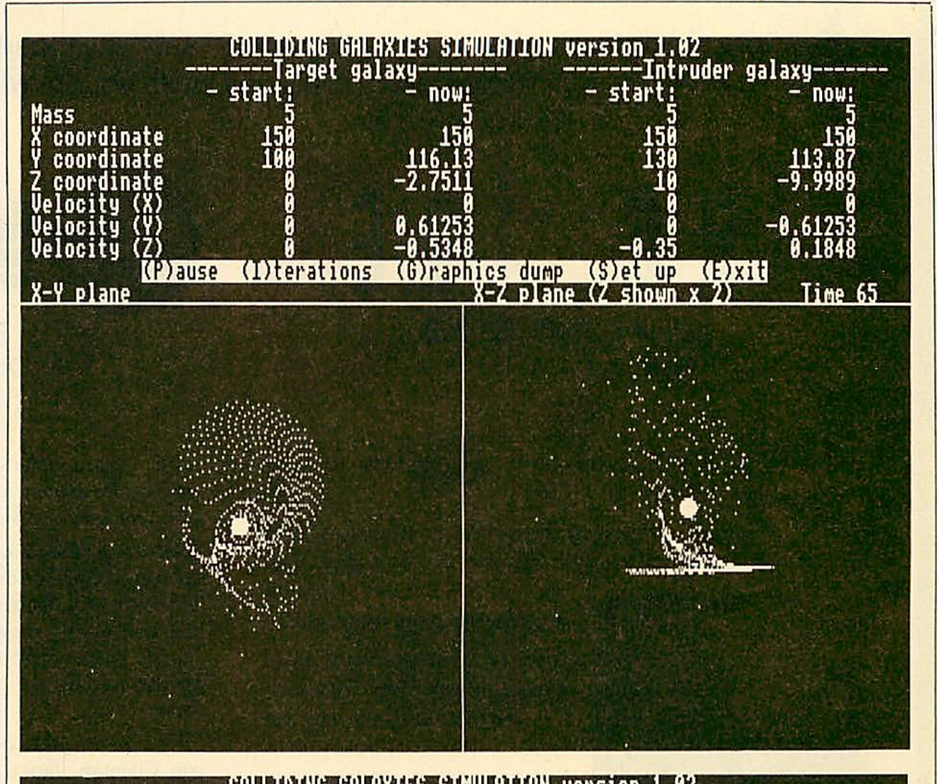
Amateur Astronomy *edited by Colin Ronan, published by Newnes. A good starting point.*

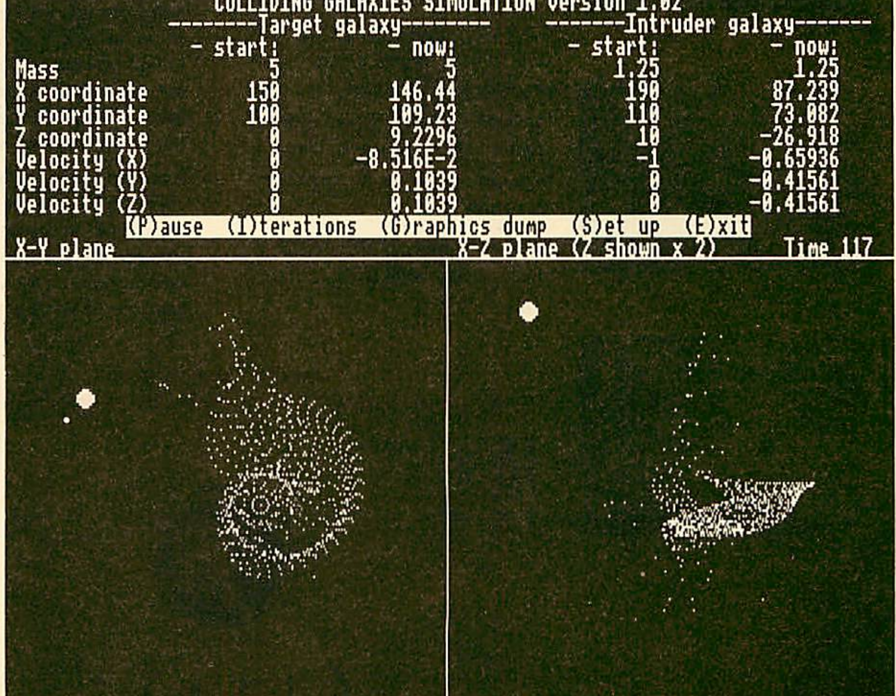
Star Gazing Through Binoculars *by Mensing. A practical guide for observation.*

Colour Atlas of the Galaxies *edited by Wray, published by Cambridge. This includes a superb set of colour photographs of the galaxies. This program is based on an article by M C Schroeder and N F Cumins appearing in the December 1988 issue of* Astronomy *magazine.*

STARTING PARAMETERS

Mass fraction (%)	*Position* X	Y	Z	*Velocity* X	Y	Z	*Result*
100	7.5	0	35	0	0	-1	Ring
25	40	10	10	-1	0	0	Bridge
25	-30	30	0	0	-0.34	0.34	Whirlpool
100	0	30	10	0	0	-0.35	Half Antennae





Complex galactic shapes are formed by close collisions after a large number of time periods



Some real classics from Clares, "Arcade 3" and "Overload". Pit your wits against Mega Monsters, defeat Deadly Invasions, push your playing powers to the limit.



OVERLOAD

THE MEGA MONSTER EXPERIENCE

This three-in-one combination will tie you to your computer terminal for hours.

First, there's an invasion by the Evil Aliens (they're always doing that sort of thing). You are a star cadet. Can you save Zarkon from a grizzly and gruesome fate?

ZARKON INVASION

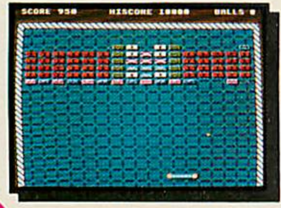
And here's a hungry little game, Mazey Man. He's feeling peckish but so are the guards, it's eat or be eaten in this gastronomic maze game.



MAZEY MAN

Bounce-A-Ball's fun, that is if you're not a brick. Because bricks get broken in this colourful and complex game, smash the colourful bricks, but can you be as quick as the ball?

Arcade Three, three tests of skill and ingenuity from Clares.



BOUNCE • A • BALL

It's a mega-monster experience. Why? Well it's all Igor's fault you see. He created a whole host of video nasties after booby trapping Frank 'n' Stein's interstellar cell phone.

As a fitting reward for this dastardly deed, Igor is sentenced to life imprisonment in a spheroid. But spheroids being the dull places they are, drive Igor to suicide, and the trouble is, the nasties are still on the loose.



Here's where you come in, you are Cheetah, Igor's 11 legged flea. Your job, sort out those evil slime balls! It's not as easy as it looks, however, Frank 'n' Stein's set up a little sabotage of his own and the nasties must now die in the correct order.



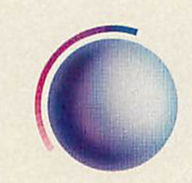
And if that isn't bad enough, there's a time limit too. Squash the nasties in the wrong order or exceed the time limit and you could end up... well, it's just too horrible to write about.



Clares have done it again.
These games will test your skills, patience and dexterity to the limit.

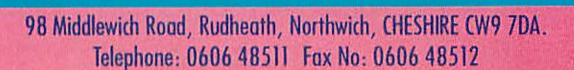
£14.95











CHECK IT OUT

For all those mistakes that keep cropping up in your letters and documents, Textchecker can offer the answer

[redacted]

Chris Robbins

The trouble with wordprocessors is that they allow you to make errors even faster, not to mention more frequently! It's not that they aren't useful, powerful and extremely versatile in their applications but trivial mistakes are so easy to make, and just as easily overlooked.

Take duplicated words for example example. Finding them can be quite a strain – a bit like looking for a needle in a haystack. If you've spotted the deliberate mistake, well done, but it's not always that easy, especially when checking any quantity of text. For those who still haven't detected the error, 'example' has been typed twice in the very first sentence of this paragraph!

Textchecker has been designed to locate this and other errors. Written in the *Wordwise Plus* text processing language, and so requiring the *Wordwise Plus* Rom, it can nevertheless be used with text files imported into *Wordwise Plus* from other wordprocessors such as *View or Interword.*

The text to be checked is held in the main text area, while the *Textchecker* program runs in segment 0, with another segment being used to hold program data. To simplify loading and startup of the program, a short Exec file is given, which sets up segment nine as the data area. Another area can be used simply by changing the value assigned to L%. The program can be restarted at any time simply by pressing Shift-f0.

Once running, a menu is displayed giving options to load and save text, and to perform various checking functions. These need a little explanation.

Option three (word check) scans the main text area looking for instances of one of the commonest errors, duplication. Having selected this option, the user can choose either to continue checking from the current position in text or to start from the beginning.

```
Wordwise Plus Text Checker
(C) C.Robbins 1988
1) Save text
2) Load text to be checked
3) Word check
4) Spelling search
5) Multiple characters
6) Sentence check
ESC - return to Wordwise Plus

Please enter choice
```

Load, save and check options are displayed

```
Words-1306  Characters free-12686

SEG 0
REM File S.TEXTCHE

REM (C) 1988 C.G. Robbins

REM Program to check for common errors
REM in WW+ text files
REM e.g. duplicated words, multiple use
REM of the same letter, common spelling
REM errors etc.

GOTO main-program

REM PROCS ******************************

REM Move down spelling list
.select-down
  VDU 31,0,Y%
  PRINT " "
  Y%=Y%+1
  IF Y%<=N% THEN GOTO select-next
```

Textchecker helps achieve error-free text

For the sake of speed, the text isn't displayed while it's being checked, only if *Textchecker* locates a possible error. Its position is indicated by the flashing cursor and a message indicating *Textchecker's* findings is displayed at the bottom of the screen.

The error may be corrected there and then, after replying N to the prompt to continue. Having fixed the problem, the checking process can be restarted by pressing SHIFT-f0. This brings up *Textchecker's* menu, from which option three can be selected, and the search continues from the current position in text. This method of operation applies to all the text checking options.

Option four (spelling search) isn't a spelling checker in the accepted sense. Rather, it's a way of picking up lapses in spelling. Put another way, it allows you to get consistent spelling (whether it's right or wrong!).

An obvious example is the case of 'i before e except after c'. One I always have a problem with is whether to use 'ise' or 'ize' in words such as 'organise'. I recognise both forms and tend to mix them up!

The spelling search option provides a means of automatically locating such problems. *Textchecker* allows you to select spellings from a list held in the data segment, or alternatively enter an example of your own. Using the list is simplicity itself, the cursor keys are used to move a pointer up or down to select the required problem spelling.

From then on program operation is exactly the same as the check for duplicated words. You can of course modify the supplied list of problem spellings to suit your own requirements or devise your own and load these into the data segment.

Option five (multiple characters) tests for the presence of possible invalid repetition of letters. A combination such as 'lll' for example, is the sort of mistake that's easily made by keeping a finger on a key for just a touch too long.

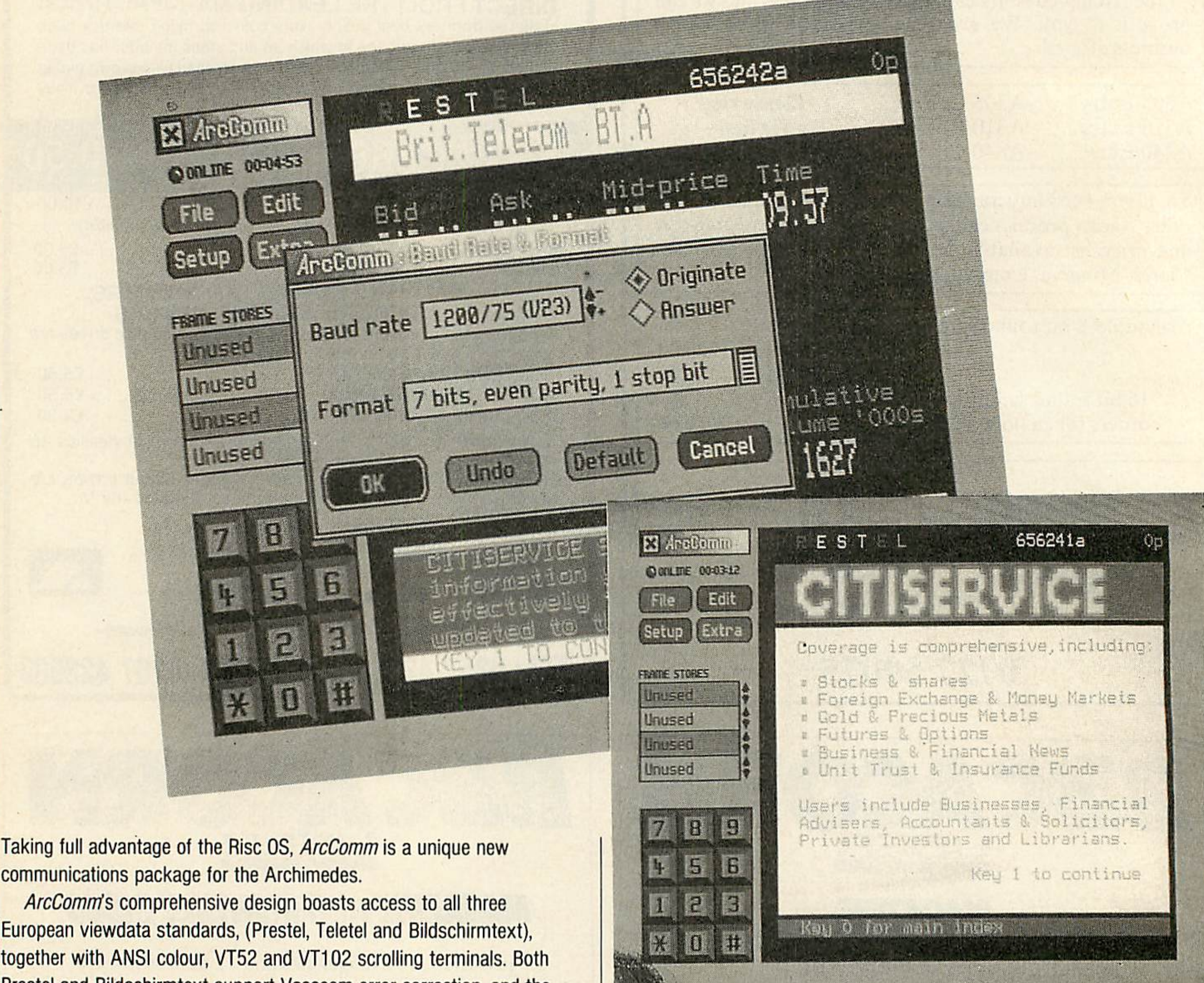
Option six (sentence check) checks that sentences have been correctly terminated or, put another way, that they start correctly.

Textchecker is far from being all powerful, and it won't produce polished prose. However, if you use all of the options, it can certainly show you where to take a file to get rid of most of the rough edges.

Incidentally, it is also possible to improve *Textchecker's* performance even further by applying the rules I gave on program compression in the March 1989 issue of *BBC Acorn User*.

OFFERS

ARCCOMM



Taking full advantage of the Risc OS, *ArcComm* is a unique new communications package for the Archimedes.

ArcComm's comprehensive design boasts access to all three European viewdata standards, (Prestel, Teletel and Bildschirmtext), together with ANSI colour, VT52 and VT102 scrolling terminals. Both Prestel and Bildschirmtext support Vasscom error correction, and the VT102 terminal offers 132 columns, and smooth scrolling. Full coverage of international character sets is included.

The package has been produced with ease of use as a priority. All screen displays are clear and uncluttered, with pop-up menus and dialogue boxes making control as simple as possible.

You won't have to remember strings of numbers! Its telephone number list allows you to dial and log-on automatically. You can store viewdata frames while on line, edit and upload mailboxes, and load/save frames or screens onto disc.

While communicating, it makes use of the full screen, rather than running in a desktop window. But you can return to the desktop at any time, and *ArcComm* remains running as an icon on the icon bar. You can use other desktop software while *ArcComm* stays on-line but inactive. And clicking on the icon brings back full-screen communication.

You can automate the log-on sequence for any comms service, by using *ArcComm*'s own procedure language. This allows you to log-on, set up the correct terminal emulation and all your preferences through a single menu selection.

ArcComm supports Hayes, DTI and manual modems, with details of how to write drivers for other modems in the User Guide provided. You will need Risc OS to use the package, and 1 Mbyte or more of memory. The package costs £29.95.

Communicate with Risc OS!

Please send me ________ copies of *ArcComm* at £29.95

I enclose my cheque/postal order for £ ________
made payable to **BBC Enterprises Ltd**
Orders must be accommpanied by cheque/PO

NAME ________

ADDRESS ________

____

________ POSTCODE ________

SIGNED ________ DATE ________

Send this coupon with your cheque to **ArcComm Offer, BBC Acorn User, Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ.**



GET THE FAX

Yes, you can save money and still be a yuppie. Fax-Form will fill your filofax easily – and at a low cost

Michael Geller

The personal organiser has become popular over the last few years but for many (including me!) the cost of pages is prohibitive. With this in mind, I wrote the *Fax-Form* program to edit and print out pages for personal organisers.

The program can put horizontal and vertical lines in both solid and dotted styles, as well as text, onto a page, and allows printout to an Epson compatible printer. It also allows pages to be saved to disc and loaded back in later.

The program runs in mode 0, to allow an accurate representation of the printout on screen. I have tried to make the program easy to use so it is menu-driven and contains on-screen prompts and instructions.

The program is rather long and greedy on memory, so it will only run on machines equipped with shadow Ram – such as the Master 128 and Compact, B+ and B+128 and expanded model Bs and Electrons. It also runs on the Archimedes.

When the program is run, the screen will clear to a dotted pattern, and a window will appear in the middle of the screen. The window contains a three-option menu (known as the Format menu), which prompts for the format of the finished page (horizontal or vertical) or for abortion of the program. Having selected one of the first two options, the format menu will disappear, and two windows will appear. One contains the main menu, which has nine options. This window will also be used in the course of the program to prompt the user about the input, and to give instructions. The other window, which is larger, is the page window, and this is where the actual page design will take place. The position of the window will depend on which format has been selected. If it is vertical, then the window will appear on the far left-hand side of the screen. If horizontal format has been selected, then the page window will be across the top of the screen. The vertical window is 36 by 36 characters in size, while the horizontal window is 72 by 16 characters. Both these have been chosen to fit comfortably on a standard page of personal organiser paper.

The program allows orthogonal (horizontal and vertical) lines to be drawn in either solid or dotted styles, which is all that is required for most typical organiser pages (forms, timetables, diaries etc), and the first four options on the main menu deal with these. After pressing '1', the menu window will contain an instruction to position the first point. A crosshair cursor will be seen in the page window.

This cursor can be moved to anywhere in the page window. When the first point of the required line is reached, 'fix' this point by pressing TAB. This is used throughout the program as a 'fix' key. Having chosen the first point, use the left and right arrow keys to select the other point. Pressing TAB again will draw the required horizontal line, and return you to the main menu. Note that after the first point has been selected, the up and down cursor keys are disabled as moving the second point vertically would not result in a horizontal line.

From the main menu, selecting option 2 (dotted horizontal lines) will allow a

ILLUSTRATIONS BY CARMAN VALE

dotted horizontal line to be drawn in the same way. Note that the crosshair cursor is now dotted. Options three and four (vertical and dotted vertical lines) are used in the same way to draw solid and dotted vertical lines.

The cursor keys are used to move to the first point, and TAB selects it. Then the up and down cursor keys choose the second point which is again selected by TAB. On all cursor movements, the cursor has full wraparound on all four sides of the page window.

Option five (text) allows text to be included on the page. On pressing '5', a flashing underline cursor appears in the page window, which can be moved within the window using the cursor keys. If the cursor is driven off the edge of the page window, it will wraparound to the opposite side. Text can be typed in as normal on the keyboard. The DELETE key will move the cursor one character back and erase the character there, and RETURN will move the cursor to the start of the following line. The editing of text is very similar to using a wordprocessor in overwrite mode. In addition, function keys f0 to f7 can be used to insert the graphic characters which make up the four line styles at the cursor, and are useful if you have inadvertently erased a line with text. Pressing TAB will return you to the main menu.

Mon	MUSIC	-	MATHS	ENGLISH	FRENCH	GERMAN	PHYSICS	-
Tue	FRENCH	ENGLISH	PHYSICS	BIOLOGY	-	G A	M	E S
Wed	MUSIC	MATHS	-	ENGLISH	-	CHEM'RY	-	GERMAN
Thu	GERMAN	-	CHEM'RY	FRENCH	-	G A	M	E S
Fri	PHYSICS	MATHS	ENGLISH	BIOLOGY	-	MUSIC	GYM	CHEM'RY

MENU

1. Horizontal lines
2. Dotted horiz. lines
3. Vertical lines
4. Dotted vert. lines
5. Text
6. Load page
7. Print page
8. Save page
9. Quit

Designing a timetable using Fax-Form

Selecting option six (load page) will allow you to load a previously saved page for subsequent editing or printing. The program prompts for a filename which will be entered in the menu window. If you subsequently decide not to load a page, or you select option six by accident, then pressing RETURN while entering a filename will abort the load operation and return you to the main menu. If you do enter a filename, and press RETURN, the computer checks that a page with this filename exists on disc before loading into the computer's memory and displaying. The page window will be in the correct format (horizontal or vertical) for the new page.

The print option (option seven) allows the page to be printed to an Epson compatible printer. Before selecting it, turn on and set up the printer. The most convenient way to produce printed output is to use the pre-punched fanfold stationery available for personal organisers. This has the six holes pre-punched in the paper, and has sprocket holes for use with a tractor feed, and so can be positioned accurately. Alternatively, blank cut sheets of personal organiser paper can be bought and used on a printer with friction feed. With this method, take care to align the paper accurately, as there is little room around the edge of the paper. Either way, when the printer is ready, pressing 'seven' will cause the page to be printed, and the main menu will be displayed when printing is complete.

To save a page, select option eight. Like the load option (option six), the save operation can be aborted by pressing RETURN without a filename. Otherwise, the current page will be saved under the filename entered. When a page is saved, its format is included so that it can be reloaded in the correct format.

Finally, option nine (quit) allows you to leave the current page, and returns you to the format menu. You can then start work on a clean page, or leave the program entirely and return to Basic.

The data for the edited page is stored in five 128-byte pages (starting at the variable page%) plus one byte. This final byte holds the Ascii codes for 'H' or 'V' corresponding to a horizontal or vertical format page. The procedure PROCgetformat prints the title and the format menu, and after obtaining the format calls appropriate procedures. The format is also held in Boolean form in the flags horiz% and vert%, with a third flag quit% to determine whether the program should be aborted or not. The procedures PROCpage and PROCvpage will set up and draw the page window (complete with holes!), and PROChorizvars and PROCvertvars set the flags, and the variables height% and width%, which are the dimensions of the page window. On Master 128s and micros with Acorn's GXR Rom, a dotted background is achieved using an Extended Colour Fill Pattern, defined at line 50 and used in line 4450. Delete these lines if you do not



have a Master 128 or GXR Rom.

The main loop of the program runs from line 330 to 420. In this loop, the main menu is displayed, and an option number (choice%) returned. This is done in the function FNmenu. The outline text used in the title is printed by the procedure PROCoutline, which prints the text (using VDU 5) in the foreground colour displaced by one pixel from its actual position. Then it is printed in its correct position in the background colour. After FNmenu has returned the option, it is subsequently acted upon.

Option one and two call PROChorizline, which takes as its argument an Ascii code of the user-defined character required to make up the line. The characters are defined in line 100-180. The two loops that return the co-ordinates of the endpoints of the line run from lines 3090-3220 and lines 3290-3380. Line 3400 needs some explanation. Since the endpoints of the line could have been chosen left followed by right, or right followed by left, the SGN function is used, returning the 'direction' of the line. However, the two points might have the same co-ordinates, and in this case the SGN function would return zero. To avoid this, the expression (xpos%=oxpos%) is included at the end of the line. This will yield a step of one if both points have the same position. The character is stored in memory by the procedure PROCstore, and FNretrieve does the opposite, returning the character at a particular position.

When drawing the line, it is necessary to check if the line crosses another line. In this case, a 'cross' character is required. The array 1kp (AB) (initialised in PROCdotable) contains the Ascii code of the character required when character A is superimposed on character B. The procedure for drawing vertical lines (PROCvertline) is very similar to PROChorizline.

The procedures PROCwindow and PROCmwindow select the page window and the menu window respectively. They are used extensively in the program to switch windows. For example, the text editing procedure PROCtext calls PROCwindow to print the title and instructions (lines 2060-2080) before selecting the page window for editing. If an alphanumeric character is typed, PROCalphachar prints, and stores it. PROCgraphchar does the same for the characters on the function keys. The delete key sets the delete% flag to delete the character at the left of the cursor, and the procedure is ended when Tab is pressed (Ascii 9)

***Fax-Form* lets you design pages both horizontally or vertically**

Text and lines are all it takes

PROCload will load a page into memory. It checks if the file exists by OPENINing the file. If the function returns zero, the file does not exist. The OSCLI command is used to load the file, so Basic 1 users will have to replace line 2900 with:

```
2900 PROCoscli ("LOAD "+files$+"
"STR$(page%-1))
```

and add a procedure like the following:

```
4680 DEF PROCoscli ($&700)
4690 LOCAL X%,Y%
4700 X%=0
4710 Y%=7
4720 CALL &FFF7
4720 ENDPROC
```

Similarly, the save option uses OSCLI to save the page to disc, so line 2770 must be replaced with:

```
2770 PROCoscli ("SAVE "+file$+"
"+STR$(page%-1)+"
"+STR$(page%+&500)
```

After loading, PROCdisplay is called, to show the new page on-screen. It replaces each character at the end of a line with CHR$, allowing use of the $ (string) indirection operator for speed. The final character is put in afterwards.

The print routine, contained in the procedure PROCprint, is called by option seven. Printing is carried out in a mixture of graphics and text modes. Lines are printed in two passes of 16-dot graphics (using the ESC"^"sequence) for high quality. Text is printed in Elite mode, because this text has exactly the same aspect ratio as text in mode 0. The data for graphic printing is set up in the procedure PROCpchars, and stored in the array pchar$(). PROCoutput sends this data to the printer one byte at a time. The function FNjoiner is used since when outputting to a printer, gaps are left between lines. FNjoiner returns the code for a vertical line if the characters on and below the current line have vertical components, and so allows unbroken vertical lines. It can return codes for either a space, a solid vertical line or dotted vertical line.

Finally, the quit option on the main menu causes the program to drop out of the main loop into the outer loop to redisplay the Format menu. Pressing 'Q' now returns to Basic.

BASIC V
A Dabhand MiniGuide

NEW Do you already know BBC BASIC, but want to easily take in the rich new features of Archimedes BASIC V, without wading through the basics of FOR...NEXT etc. This new book from RISC User Editor Mike Williams explains it all lucidly with copious examples - covers WHILE, CASE, multiline IF, stereo sound, mouse and pointer programming, matrix operations, extended graphics, 256-colour palettes, extended and LOCAL error handling, the ARM assembler, and much much more. Includes RISC OS BASIC V extensions. Only £9.95 - Available now.

Master 512 Shareware Collection - Volume 2

Due to high demand, Dabs Press have released a second collection of shareware discs compatible with the Master 512. Once again, five discs, containing nearly 4Mb of shareware, including a full feature database, excellent forms designer, typing tutor, word processor, programmers text editor, equation calculator, astronomy star map program, and much much more. Five 800k discs full-rice only £29.95 incl. VAT. If you bought Pack 1 (still available, also £29.95 inc. VAT), claim a sixth bonus disc with your order.

DABS PRESS

The premier Acorn computer book publisher

5 Victoria Lane, Whitefield, Manchester M25 6AL. Tel 061-766 8423. Prestel 942876210. BT Gold 72:MAG11596

Mastering Interpreters and Compilers

This detailed 314pp book by veteran BBC author Bruce Smith explains how interpreters and compilers work, starting with a simple language, GRAFRITE, and building up to a major work, a complete ready-to-run threaded interpretive language, for which a full source listing is provided. Thorny topics such as reverse Polish notation, stacks, and libraries are made painless in Bruce Smith's famous relaxed style. The book is applicable to everything from an Electron to a Master 128, and all examples work without the need for any additional hardware. Comes with FREE disc containing all the listings in the book. £14.95 incl. VAT

Archimedes BASIC Compiler Version 2

The all-new Archimedes BASIC Compiler version 2 converts your BBC BASIC V programs into fast, efficient ARM machine code quickly and simply.

Just look at these features:

- Stand-alone, distributable code
- Speed increases of up to 4000%
- Code size ratio 1:1 approx.
- Supports floating point arithmetic
- Installs as icon on RISC OS desktop
- Run from command line if desired
- Makes relocatable modules
- Full in-line assembler support
- Double and extended FP precision
- No royalties to pay on compiled code
- 236pp of documentation

Free demo pack and specification sheet available on request.

Already in use by Acorn, Careersoft, Clares Micro Supplies, Ian Copestake Software, Labelwise, Lingenuity, Simtron, Superior Software, TechSoft, and dozens of other professional developers. Join them, and give your programs that extra edge. Price - £99.95 inc.VAT

Coming soon—ABC65, a version of the compiler which generates standalone BBC Micro code, and ABX, development utilities for ABC.

ARCHIMEDES BASE UNITS

A3000 (phone for availability) £599
Archimedes A410 .... £1099
Archimedes A420 .... £1599
Archimedes A440 .... £2399
Archimedes A310M £899
Second 3.5" drive £109
External 40/80T 5.25" incl. Arc interface £149
A310 4-slot backplane £59
A310 Official Hard Disc upgrade £449
400 Series RAM and Hard Discs .... £CALL
I/O Expansion Card £79
RISC OS (phone for availability) £29
Arc Modem Lead (correctly wired!!) £8.65
Keyboard Extender £8.65
Virtually all other leads .... £8.65 or less

All Archimedes computers come with free ABC Compiler, Alerion or Arcendium game.

MASTER COMPUTERS

Master 128 .... £399
6502 Turbo Co-Processor Board £109
Master Compact (incl. disc drive) £329
Compact PAL TV interface £26

Substantial educational discounts available on Master 128, A3000, A310, and A410.

BBC CUMANA DISC DRIVES (All 40/80)

Single Drive without PSU £109
Double Drive without PSU £199
Extra for integral power supply unit £20

MONITORS (FREE ARC OR BBC LEAD)

Acorn (Philips) Mono £79
Acorn (Philips) Colour £199
Philips CM8833 Stereo £229
Taxan 770+ MultiSync (superb quality) £499
Oak 20" MultiSync monitor £1295

9-PIN PRINTERS (free BBC/Arc lead)

Panasonic KX-P1081 .... £149
Panasonic KX-P1180 (1124 style case) £199
Star LC-10 (Cheapest 9-pin with Sh.Fdr.) £200
Star LC-10 Colour £239

24-PIN PRINTERS (free BBC/Arc lead)

Panasonic KX-P1124 (the best!) £265
Sheet Feeder for above £99

Other 9-pin, 24-pin, Lasers. Please ring.

CHECK OUT OUR PRICES! AND NO UK CARRIAGE CHARGES

DABHAND COMPUTING



A3000 = £599
A410/1 = £1099
A420/1 = £1599
£115-worth of free software. Fully expandable. RISC OS incl.

ARC SOFTWARE

ANSI C Compiler + free C book £99.00
PC Emulator + free PCE Shareware £99.00
Arc PCE Shareware Pack £34.39
ABC Compiler £86.91
Alerion, Arcendium .... (ea). £13.00

All other Arc software at 5% disc.on RRP, eg,

PipeDream £94.05
PipeDream Spellchecker £40.85
Euclid by Ace £37.17
Autosketch £75.05
Artisan PLUS Support Disc £49.48
ProArtisan £140.39
Orion, Hoverbod etc. .... (ea.) £12.35

Additional Arc Software Manuals (Acornsoft)

First Word Plus, Assembler .... (ea.) £10.00
C, Pascal, Fortran, SymDebug .... (ea.) £8

BBC MICRO SOFTWARE

HyperDriver printer driver £26.04
MiniDriver (for Mini Office II) £21.70
MOS Plus ROM £11.26
Fingerprint m/code monitor £8.65
SideWriter pop-up notepad £6.91

Master 512 Shareware Vol. 1 .... £26.04
Master 512 Shareware Vol. 2 .... £26.04
ViewSheet, ViewStore .... (ea.) £49.40
ViewPlot £24.73
All Acornsoft, CC, etc. .... 5% discount

BOOKS (no VAT)

VIEW: A Dabhand Guide £12.95
Master Operating System £12.95
ViewSheet/ViewStore £12.95
C: A Dabhand Guide £14.95
Mini Office II: A Dabhand Guide £9.95
Master 512: A Dabhand Guide £9.95
Mastering Interp. & Compilers £14.95
Archimedes Assembly Lang. £14.95
Arc. Operating System £14.95

All above Dabs Press books have accompanying disc - add £5 for 5.25", £7 for 3.5"

BASIC V: A Dabhand Guide £9.95
Assembler Bundle .... £4.95 (inc. VAT)
Arch. Programmers Ref. Man. £29.95
Master 128 Ref. Man.Pts1&2 .... (ea.) £14.95
New Advanced User Guide £19.95

ACCESSORIES/MISC Ask on other items

Master EPROM Cartridge £10.95
Master Universal CoPro Box £49.00
Econet Module £49.00
512 DOS+ Econet Version £149
BBC B 1770 disc upgrade £49
Model B/B+ User Guide £10
Miracom WS3000 Modem V22bis £339

TERMS: UK residents add 15% VAT to all prices, but **carriage FREE on all items in the UK.** Export, no VAT, carriage at cost (quotations available). Europe maximum £2.50 software, £20 hardware. Access/Visa/Style cards accepted by post/phone/in person. We are authorised Acorn dealers. Official orders accepted from public sector/PLCs, otherwise cash with order.

DABHAND COMPUTING LTD
5 Victoria La., Whitefield, Manchester M25 6AL

061-766 8423

COMPUTECK "The Trade-in Specialists" **APPROVED ACORN DEALERS**

ARCHIMEDES

	Basic	Mono	Colour
A305	803.85	872.85	1056.85
A310	1033.85	1102.85	1286.85
A310M	1102.85	1109.75	1355.85
A410	1378.85	1447.85	1631.85
A420	1953.85	2022.85	2206.85
A440	2873.85	2942.85	3126.85

A3000 Now Available £746.35

Archimedes with Colour Monitor

Ring for special price!!!

We are now giving a voucher for 10% of the value you spend on all NEW Acorn computers!! That means if you buy a 410 colour you will receive £163 to spend on anything.

* Master 128 .... £504.85
* Compact series from £401.35

Cambridge Z88 Lap Top £267.37
Sec/User BBC B's from £199.00
6502 Sec Processors £103.50U

MONITORS

Philips 8833 Colour £275.82
Philips 8801 Colour £194.95
Philips 7502 Green £83.65
Microvitec 1431 .... £211.64
Microvitec 1431 .... £149.50U
Microvitec 1441 .... £230.00U
Kaga Taxan Sup/v III £395.98
Tatung Colour Std/Res £175.00

PRINTERS

Panasonic KX P1081 .... £169.00
Panasonic KX P1082 .... £243.80
Citizen 120D £149.50
Epson LX800 .... £268.80
Epson LQ800 .... £539.05
Micro P135+ £159.36
Seikosha SP180AI £138.00

NIDD VALLEY PRODUCTS

Digimouse mouse only £32.78
Digimouse+Graphic £35.91
Digimouse+Illustrator £40.39

*** We Specialise in Trading in Used Hardware & Software also we will buy in certain Software & Hardware**

*** Anything we have for almost Anything you have**

***** NEW LAMPS FOR OLD!!! *****

LASER PRINTERS

Epson GQ3500 laser £1692.68

VARIOUS HARDWARE

Mertec Companion £29.00U
ATPL Sideways ROM Board £41.50
Cambridge Z88 32K RAM £18.95
Cambridge Z88 32K ROM £18.95
Cambridge Z88 128K RAM £47.43
Cambridge Z88 128K ROM £47.43
Cambridge Epron Eraser £37.95
Cumana Touch Pad £34.50U
Graph Pad £69.00U
Morley AA Board £43.64
Digimouse (Compact) £23.00U
Pace Nightingale Modem £69.00U
Ferguson TV tuner £55.00
Watford Aries B12 .... £29.00U
Vine Micros ROM Board 4 .... £26.94
Watford Aries B32 .... £58.99U
Watford Eprom Eraser GT £23.00U
Watford 16K Disc RAM £23.00U
Miracle WS200 Modem £69.00U

ADVANCED MEMORY SYSTEMS

AMX Design £46.00U
AMX Mouse+Superart+OS £46.00U
AMX Superart £34.50U
AMX Max £12.00U
AMX Desk £15.00U
Extra Extra! £15.00U
AMX 3D Zidcon £13.80U
AMX Stop Press £33.00U

DATABASE SOFTWARE

Mini Office disc 5.25 .... £12.70
Mini Office disc 3.5 .... £16.45

ADVANCED COMPUTER PRODUCTS

Adv. Control Panel £32.08
Adv. Disc Investigator £26.73
Adv. Disc Toolkit £32.08
Adv. File Manager £25.87
Plus all ACP products less 10%

**** We Stock ALL the popular and unpopular games both new and used from as little as £1.72**

*** The above are just a few of the items we have on our lists, at present we have over 1500!**

Please tel. or send a large SAE for up to the minute prices

DISC DRIVES

No PSU Drives:
Ahkter 40/80 400K Single £118.95
Ahkter 40/80 800K Dual £229.44
Cumana CSX400 Single £138.54
Cumana CDX800S Dual £256.45
Pace PSD3 Single £137.13
Pace PDD3 Dual £254.86
Single Drives 40T £98.90

With PSU Drives:
Ahkter 40/80 400K Single £131.69
Ahkter 40/80 800K Dual £276.20
Cumana CS400 Single £161.95
Cumana CD800S Dual £305.94
Pace PSD3P Single £161.71
Pace PDD3P Dual £302.73

Hard Disc Units:
Ahkter 20meg HD2000 .... £539.94
Ahkter 40meg HD4000 .... £809.94

We are about to introduce our own brand of Drives. Please telephone.

see us at the **BBC ACORN USER** *show '89* **Stand No. 89a**

ACORNSOFT

ISO Pascal for Master £134.50U
Fortran 77 Archi £69.00U
Over View £57.50U
Logo £39.00U
ISO Pascal ROM £55.20
Lisp £18.40
Logistix (Archimedes) £102.46
Micros in Business £39.95
Twin (Archimedes) £30.00
View 3.0 .... £47.84U
View Index £11.96
View Plot £23.95
View Professional £79.94
View Sheet £47.84
View Spell £23.00U
View Store £36.80U

WIGHT SCIENTIFIC

Wight Signwriter £26.94
Fonts for above each £5.17

*** All Prices in this Advert include VAT at 15% Post and Packing charges £1.00 for light items, £2.45 for medium items. Expensive products £8.50 courier delivery. Items marked "U" are used stock**

BEEBUG SOFT USED SELECTION

Toolkit Plus £20.70U
Murom £13.80U
Help £11.50U
Printwise Disc £20.70U
Quickcalc Disc £11.50U

*We stock the complete range of Beebug Soft all Discounted.

CLARES MICRO SUPPLIES

Alpha Base (Archimedes) £44.94
Artisan (Archimedes) £35.95
Toolkit (Archimedes) £35.95
Brom BBC £11.50U
Macrom £17.25U
Artroom £13.80U
Fontwise 3.5" package £30.59

COMPUTER CONCEPTS

Inter-Base £55.20
Inter-Chart £29.44
Inter-Sheet £45.08
Inter-Word £34.50U
Inter-Chart (Archimedes) £23.00
Inter-Sheet (Archimedes) £35.88
Inter-Word (Archimedes) £35.88
Mega 3 ROM £87.99
Spell Master £47.19
Wordwise Plus £30.00U
Disc Doctor £13.80U
ROM podule Arch Bat/Back £64.44

DABS PRESS

Master Guide Book £11.65
Viewstore/Sheet Book £11.65
View Guide Book £11.65
Hyperdriver £19.95U
Program Discs for books £7.14
Hyper Driver £26.49

VINE MICROS

Replay Tape to Disc £26.91
Romboard 3 .... £17.94
Romboard 4 .... £26.94
Write Protect Switch £8.05
TD ROM for BBC B £13.80U

COMPUTECK Ltd. Dept. (AU)
Dinting Lane Industrial Est
Glossop
Derbyshire SK13 9NU
VISA/ACCESS Tel. 04574 65953

MINERVA SYSTEMS

System Delta+Card Index £58.45
Deltabase (Archimedes) £17.25U
System Delta Plus (Archimedes) £62.95
Accounts Packages all 10% Disc.

PERMANENT MEMORY SYSTEMS

Genie in a Box £71.41
Genie Junior £22.49
Genie Master Cartridge £71.41
Genie Utilities £8.94
Genie Real Time Clock £26.08
6502C B2P Sec Processor £80.95

Introducing three titles under our own label "SENSIBLE SOFTWARE" Price £14.95

The Menu

Displays both sides of a disc on scrolling window; Auto LOADS BASIC, M/Code & WP files; File handling made easy; Shows all 16 ROMs; Loads ROMs automatically in SWR and save to disc. This is what a !boot file was made for.

The List

Auto selects DFS/ADFS; Allows 39 chars. description of files so months later you know what a file was and where it is; ADFS path route shown and routine made easy; Printout of all data to keep in each disc envelope.

The Label

The ultimate Label printer, Bold, NLQ, Condensed, Enlarged, U/Lined etc. WYSIWYG on screen editing; Auto duplication from one to print as many as you want; Configures to many label sizes and numbers across. If you print labels this is a must!

*** We are mainly Mail Order but personal callers are welcome to collect goods and arrange for demonstration of computers and accessories. Please telephone to arrange an appointment.**

THIS IS THE BUSINESS

THE ACCOUNT BOOK. The easiest to use accounting system for the BBC/Acorn range. How do we know? Simple, dozens of letters from satisfied customers. Unlimited entries, automatic date order, dozens of reports, full vat facilities. Just £27.95. (see review in Beebug Vol.7, No.5)

And now: **THE INVOICE PROGRAM.** 700 customer database. Very neat invoices with huge description space (max. approx. 2000 words!), Unpaid or Paid — database or one-offs — on continuous/single paper (for use with your own letterheads if you want — any size). Part/paid invoices. Automatic statements. Credit notes. User specified messages, credit terms, overdue messages, 100 stock description labels. Full vat facilities. Instant customer credit details, full linking with The Account Book and much, much more. Amazing value at £27.95. You will not be disappointed.

Both the above programs can be used independantly or linked together.

Special offer price for both £49.95

Order by phone, coupon or send for the fact sheets.

- -

Please tick: ☐ 5.25" disc ☐ 3.5" disc ☐ ADFS ☐ DFS

☐ 80 track (minimum 1 double sided drive)
☐ 40 track (minimum 2 single drives DFS only)
☐ Account Book £27.95
☐ Invoice Program £27.95
☐ Both £49.95

NAME: ....
ADDRESS: ....
.... **POST CODE:** ....
TELEPHONE: ....
ACCESS CARD NO: ....
YOUR COMPUTER: ....
SIGNATURE ....

Please send order to **Apricote Studios, 2 Purls Bridge Farm, Manea, Cambs, PE15 OND or telephone 035 478 432 with your ACCESS card number/enquiry.**
All orders sent by return of post.



WHO BETTER TO DEMONSTRATE THE PERFECT PAINTER

Light and shadow theory c.1492

Leonardo Da Vinci, hailed as the perfect painter. Creating priceless masterpieces with oil, canvas, pen and ink that are marvelled at in galleries world wide.

Leonardo Da Vinci (1452 – 1519)



Self Portrait c.1513 drawn in Pro-Artisan c.1989

Even more mind boggling is his analysis of optical principles. Ray tracing, for example, his understanding of shadow and light (the effect of light moving three dimensional objects) reads like a computer manual.

Detail of Delta Animation

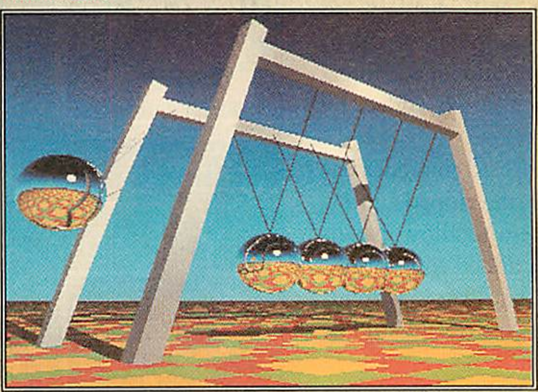
He will not have realised, but he had all the understanding of modern computer graphics, without the technology to put it into practice — what frustration.

Today, such graphics manipulation is within everyone's grasp.

What marvels then, could he have created with modern tools within his grasp?

Like Pro-Artisan from Clares. A computer graphics and image manipulation package which, combined with the Archimedes, produces breathtaking graphics. Bending, shaping, colouring and toning to your every whim.

Newton's cradle

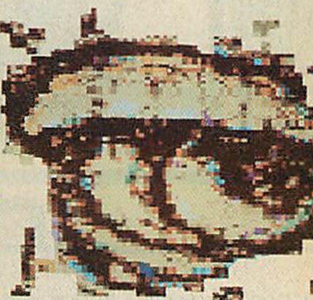


Screen detail of Render Bender

Eye Detail



Mag × 2 in zoom mode



Mag × 4 illustrating pixelisation

A modern day paintbox.

With which (it may be fair to assume) his self portrait may have looked like the image above, and with Pro-Artisan's zoom facility, he could have created even greater detail.

Da Vinci was indeed a genius.

Ahead of his time. A latterday Einstein. Creating wild and wonderful inventions like machines that fly, elaborate ships and submarines.

With Render Bender from Clares which, using ray tracing, allows the production of 3D scenes and objects. And then allows them to be animated, every shadow and reflection is perfecly calculated, appearing as it would in real life.

A computer generated movie, inside your own machine. Even better, your own soundtrack can be added.

What's more, interaction is now possible between Pro-Artisan, Render Bender and Armadeus.

A superb package, but spare a thought for poor Leonardo, if only he had then, what we have now.

RISC OS COMPATIBLE



Pro-Artisan – £169.95 inc. vat.





98 Middlewich Road, Rudheath, Northwich, CHESHIRE CW9 7DA.
Telephone: 0606 48511 Fax No: 0606 48512



Render Bender – £79.95 inc. vat.

INSIDE OUT

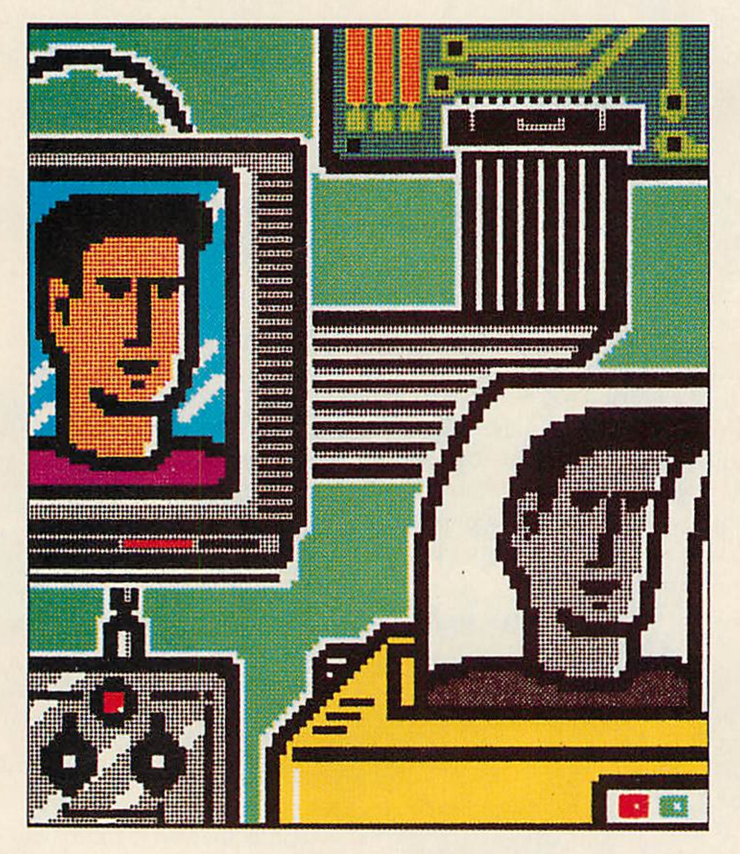
In this, the first of a series on interfacing your Arc, we look at how the expansion system works

Alex van Someren

Although there is much to be gained from a computer able to perform arithmetic at great speed, such processing power is of no value if the machine is isolated from the real world. Of course, computer manufacturers build in a number of standard interfaces like keyboards and displays to make the computer useful to humans but tailor-made interfaces may also be added by the user.

The Acorn Archimedes has a highly developed interfacing system to allow expansions to be added to the basic computer hardware, providing for just this kind of application.

A diversity of expansion cards is produced for the Archimedes both by Acorn and by third parties – everything from sound samplers to document scanners – and allows it to acquire and regurgitate information about the outside world.



While the design of such equipment requires a fairly sophisticated understanding of electronics, simpler projects can be constructed in just a few hours (or even minutes) by someone with minimal technical knowledge but an understanding of how the Archimedes expansion system works.

Indeed, the new National Curriculum demands that pupils have a high degree of knowledge and practical experience in such matters.

This article describes the fundamentals of interfacing electronic circuitry to the Archimedes for readers with a basic understanding of computers and electronics who wish to apply their skills to practical construction projects. Subsequent articles will detail a number of simple projects to which these skills may be applied.

ILLUSTRATION BY JONATHAN INGLIS

Podules

The Archimedes is designed to allow expansion cards to be fitted within the computer. (These were once known as 'podules' but this name now seems to be falling from favour). Before this is possible a 'backplane' must be fitted to provide expansion slots connected to the main circuit board.

400-series Arcs have a four-slot backplane (the largest possible) fitted already. For 300-series owners an Acorn or third party backplane must be fitted.

Any expansion card which were to be fitted to an Archimedes must follow a set of guide lines devised by Acorn to minimise conflicts produced by several expansion cards from different manufacturers. These guidelines, however, are not readily available to the public so the first job is to establish what may and may not be done.

Every expansion card needs to provide at least the first two of the following four functions to operate correctly:

● **Signal buffering.** The memory address, data and control signals which the ARM microprocessor produces must be buffered (amplified, in effect) so as not to overload the circuitry on the main board.

● **Address decoding.** In order to establish which expansion card is being addressed and which function on it is selected, circuitry must be present to decode the ARM's address signals. The first stage, deciding which expansion card is being accessed, is done by the backplane itself.

● **Expansion card software.** Each expansion card can carry Rom/EPRom memory devices containing some or all of the software needed to operate it. If it does, circuitry must be present which allows the memory device to be accessed by the operating system according to a tightly defined specification. Very simple expansion cards may not require such software, but it is usually a good idea to build some in for compatibility anyway.

● **Interrupt Handling.** Where an expansion card needs to transfer data irregularly but quickly into the computer's memory it is normal to 'interrupt' the ARM microprocessor to cause it to effect the transfer. If this mechanism is used,

circuitry must be present to allow the operating system to identify which expansion card has generated the interrupt.

Generally, guidelines concerning power supplies and consumption must be adhered to so as not to overload the Archimedes' power supply.

In particular, Acorn does not guarantee any power supply other than +5 Volts will be available on future computers so cards should really avoid using the +12V and -5V supplies. Furthermore, no expansion card should consume more than one Amp of current from the +5V supply: This is unlikely to be a limitation for most simple cards.

How the system works

The Archimedes range is built around Acorn's ARM microprocessor and three supporting chips. Of these, the Input/Output Controller (IOC) is responsible for communication with peripherals. IOC provides the serial keyboard interface, counter/timers, peripheral address decoding and timing control for peripherals and expansion cards.

IOC also drives a set of on-board buffer ICs which reduce the width of the 32-bit ARM data bus to a more manageable 16-bit for input/output. This makes sense since input/output devices rarely move data more than 16 bits at a time.

Under the control of IOC, peripheral devices may be accessed at a variety of speeds allowing older and slower ICs to be attached with minimal effort while still permitting high-speed operation for modern circuitry.

In fact, every expansion card can be addressed at one of four software selectable speeds: Slow, Medium, Fast and Synchronous. Different regions of the memory address space are used to control the speed of access, so each of the four possible expansion cards appear four times in the address map, according to the speed of access required.

The region of the address space reserved for the expansion cards and other IOC devices is between &3000000 and &3400000. This space is further subdivided into non-contiguous regions for each different access speed, with a 16K word (&4000 in hexadecimal) subdivision of each region for each expansion slot. Table 1 summarises this.

Data is fed to the expansion slots as a 16-bit half word. Transfers to or from expansion cards can be made either eight bits or 16 bits at a time. 8-bit transfer is achieved using the byte form of the relevant ARM instruction – LDRB, STRB.

Transfers of 16 bits at a time must be made using the word form of the ARM instruction, reading data from the lower 16 bits (the upper 16 being invalid) and writing to the upper 16 bits (the lower holding a duplicate for future compatability).

This contrivance is enforced by the way the hardware on the main circuit board is designed.

Address:	Slot – access speed:	
&33D0000+	Unused	
...		
&33CC000	Slot 3	Sync
&33C8000	Slot 2	Sync
&33C4000	Slot 1	Sync
&33C0000	Slot 0	Sync
...		
&334C000	Slot 3	Fast
&3348000	Slot 2	Fast
&3344000	Slot 1	Fast
&3340000	Slot 0	Fast
...		
&32CC000	Slot 3	Medium
&32C8000	Slot 2	Medium
&32C4000	Slot 1	Medium
&32C0000	Slot 0	Medium
...		
&324C000	Slot 3	Slow
&3248000	Slot 2	Slow
&3244000	Slot 1	Slow
&3240000	Slot 0	Slow
...		
&3000000	Start of expansion space	

Table 1. The expansion memory map

Pin No.	a row	c row
1	0V	0V
2	LA (15)	-5V
3	LA (14)	0V
4	LA (13)	0V
5	LA (12)	reserved
6	LA (11)	notMS
7	LA (10)	reserved
8	LA (9)	reserved
9	LA (8)	reserved
10	LA (7)	reserved
11	LA (6)	reserved
12	LA (5)	notRST
13	LA (4)	PRnotW
14	LA (3)	notPWE
15	LA (2)	notPRE
16	BD (15)	notPIRQ
17	BD (14)	notPFIQ
18	BD (13)	reserved
19	BD (12)	C1 – IIC clock
20	BD (11)	C0 – IIC data
21	BD (10)	notEXTPS
22	BD (9)	notPS
23	BD (8)	notIOGT
24	BD (7)	notIORQ
25	BD (6)	notBL
26	BD (5)	0V
27	BD (4)	CLK2
28	BD (3)	CLK8
29	BD (2)	REF8M
30	BD (1)	+5V
31	BD (0)	reserved
32	+5V	+12V

Table 2. Expansion bus interface

Interface decoding

All expansion slots receive the 16-bit input/output data bus BD0-BD15 and 14 bits of the latched address bus LA2-LA15. Only the address lines from LA2 upwards are present because the hardware makes full 32-bit word transfers so the bottom two address bits (LA1 and LA0) are always zero for word-aligned transfers.

At each expansion slot a number of signals are available which indicate the nature of any data transfer to or from the card. Decoding circuitry on the backplane produces an 'active-low' signal to each slot called 'Podule Select' (notPS). Whenever an address in the region reserved for a particular slot is accessed this signal is driven low, to zero Volts.

At the same time one or other of the Podule Read Enable (notPRE) or Podule Write Enable (notPWE) signals is also driven low to indicate the direction of data transfer.

A single Podule Read/not Write a signal (PRnotW) is also available for devices which require it.

The expansion connectors are known as 'DIN 41612ac' connectors which have two rows of 32 pins. The full expansion connector interface definition is shown in Table 2.

It is important to note that all pins marked 'reserved' must not be used since they carry co-processor interface signals in suitably equipped machines.

Constructing interfaces

By following the guidelines set out so far it is possible to construct simple expansion cards with just a handful of components. Let's see what is required to address each of the requirements already noted above, in turn.

To begin with we must buffer the address and control lines (LA2-LA13, notPS, notPRE, notPWE, PRnotW). This is easily achieved with two octal (eight-way) buffers. Since the Archimedes

Winchester Users
-Discard the Soft Option!

At last, a real solution to the problems of hard disc back up — the new Amcom Tapestreamers.

Amcom Tapestreamers provide a fast, reliable and economic means of backing-up the large amounts of data stored on Winchester hard disc systems. The speed and ease with which data is streamed onto magnetic tape makes backing-up faster, easier and more convenient with total Data Integrity. Multiple copies are easy to make, and data is quickly transferred back to the hard disc when required.

Amcom Tapestreamers provide:-

- Affordable Winchester Back-up
- Reliable Data Transfer.
- Fast Operation (80k/sec).
- Easy Multiple copies.



Amcom Tapestreamers are available to run not only on Amcoms definative E Net Winchester based networks, but also on Amcom's new ADFS compatible Winchesters and standard Acorn hard disc systems.

£699 (ex. VAT)

NOW AVAILABLE FOR ARCHIMEDES **£999** ex VAT.



Crendon Place, Amersham. HP6 5HN.
Fax: 0494 432400

is constructed from CMOS circuitry it is best to use the same kind for interfacing. The devices of choice are therefore two 74HC541 octal buffers.

The data bus must also be buffered, usually just the least significant eight bits for a simple expansion card. A single 74HC245 bi-directional octal buffer IC does this job. Its enable pin may be driven from notPS (which goes low when our expansion card is selected) and its direction control pin from the buffered PRnotW signal.

Each expansion card has its own 4K address space into which both on-board software and hardware must fit.

A common way to divide the address space is to reserve the bottom 2K for software and use the top 2K for the expansion card devices.

This arrangement is elegant because the top address line (LA13) will directly signify an access to the hardware part of the address space with a high value along with an access to the software part with a low value.

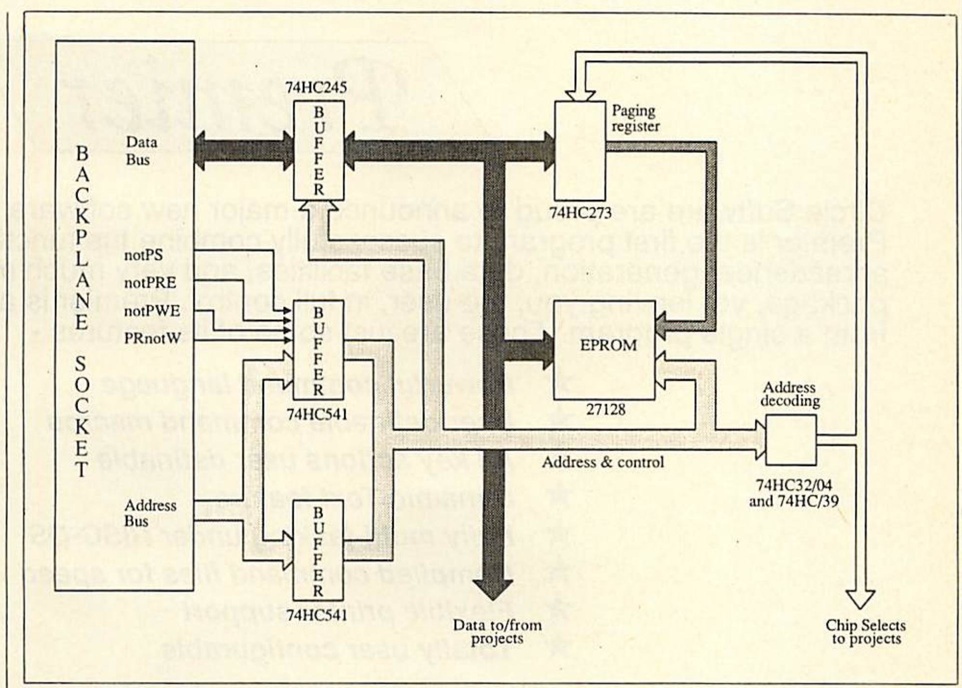
To generate a chip select signal for each of the ICs in your project design you need to gate together the select signal, direction signals and address line LA13. Because all your signals can be made active-low (invert the LA13 address), OR gates may be used throughout. The logic equations are as follows:

notValidRead = (notPS OR notPRE) OR notLA13
notValidWrite = (notPS OR notPWE) OR notLA13

This requires just four OR gates and an inverter to produce the two active-low 'valid' signals.

For devices which require a single RnotW signal we can simply AND the two 'valid' signals together, using either an AND gate or a NAND gate followed by another NAND gate wired as an inverter. You are likely to want to use several ICs so it is normal to use the 'valid' signals derived above to drive decoding devices which further subdivide the hardware address space. An excellent choice is the 74HC139 which contains a pair of two-to-four line decoders, providing four valid signals each describing 512-word sections each for reading and writing.

Because the address space available for each expansion card is so small (and further reduced by allowing half of it for hardware as just described) you need a simple system for increasing the space.



Block diagram of a podule expansion slot

In keeping with Acorn traditions a 'paging' system is usually used whereby one of several 2K 'pages' of memory is accessible in the lower 2K of the expansion card address space at any moment. This allows much larger memory devices to be fitted to the expansion card by providing several 2K pages within the device.

For such a paging system, all that is required is a writeable latch to contain the 'page number' of the selected region of memory. To conform to the expansion card specification you must be able to clear this latch when the computer is reset. Just such a clearable latch is provided by a 74HC273.

The enable signal which allows this latch to be loaded from the data bus would normally be driven by one of the valid write signals we derived earlier. This allows software to 'page' the memory device and indirectly access all its addresses.

The storage of software on an expansion card (to allow it to install itself immediately the computer is turned on) is outside the scope of this article. However, a concise summary of the techniques involved appeared in the Agora section of *BBC Acorn User* in October and December 1988.

If you wish to write your own expansion card software you would do well to refer to these issues.

For the purpose of these articles an EPRom has been developed containing a series of routines which may be accessed using the Basic command SYS. These routines allow Basic programs to directly control hardware fitted to an expansion card following the design described above and will form the basis of programs in future articles.

You have seen that the Archimedes allows up to four expansion cards to be attached to the computer. By following a simple set of guidelines, it is possible to attach almost any kind of electronic circuitry to the computer. The block diagram summarises the overall structure of this interface circuitry.

In the next article we will examine the construction of a general-purpose expansion card and in subsequent articles a number of simple constructional projects will be described, along with more detailed information about the expansion card interface specification.

To allow simple projects to be constructed without the need to rebuild the interface circuitry each time, a prototyping card has been designed to accompany these articles. The Archimedes Prototyping Expansion Card (Apec) is available either as a bare PCB or with a ready-constructed interface. It has over 65 per cent of its area laid out as 0.1in pitch square pads to allow your own circuitry to be constructed. Apec costs £25 for the bare printed circuit board with a pre-programmed EPRom and £35 for the ready-built version with EPRom. Both prices are exclusive of VAT and postage. The Apec cards are available from Atomwide, 23 The Greenway, Orpington, Kent. Tel: (0689) 38852.

INTRODUCING THE FIRST MULTI-LAYER BACKPLANE FOR ARCHIMEDES 305/310

The 4-slot backplanes currently available for the Archimedes 305 and 310 are all intended to do an identical job. They may even look very similar, ***but the fact is they are not the same.***

Whereas cheaper backplanes use a simple double-sided circuit board, ours is a true multi-layer design. This is particularly effective in reducing electrical noise. Our backplane has already been shown to work in situations where a double-sided version did not.

Fitting the backplane is a simple operation that requires no soldering.

Features;

- ★ **Multi-layer design**
- ★ **Accepts up to 4 podules**
- ★ **Co-processor option**
- ★ **12 month warranty**
- ★ **Easy to install**
- ★ **Money-back guarantee**
- ★ **Approved by Computer Concepts**

Having compared several 4-slot backplanes from different sources, Computer Concepts have given approval to ours because of its superior performance. The A440 is fitted with a multi-layer backplane as standard. Since these boards are more expensive to manufacture, it is fair to assume that it has been considered necessary for technical reasons.

28-day money-back guarantee

Prices (including VAT)

4 slot backplane	£59.95
Co-processor version	£62.95
2 slot backplane	£19.95
Fan/filter for above	£10.00
Comp. Concepts ROM board	£54.00
As above with battery back-up	£64.00
Acorn 20Mb hard disc	£515.00
New RISC OS ('phone first)	£35.00

Postage is £1.00

SPECIAL OFFERS

4-slot backplane and Comp. Concepts ROM board...£109.95 (add £9 for battery back-up and £10 for fan/filter)

Used 2-slot backplane with new fan...£24.95 (NB subject to availability)

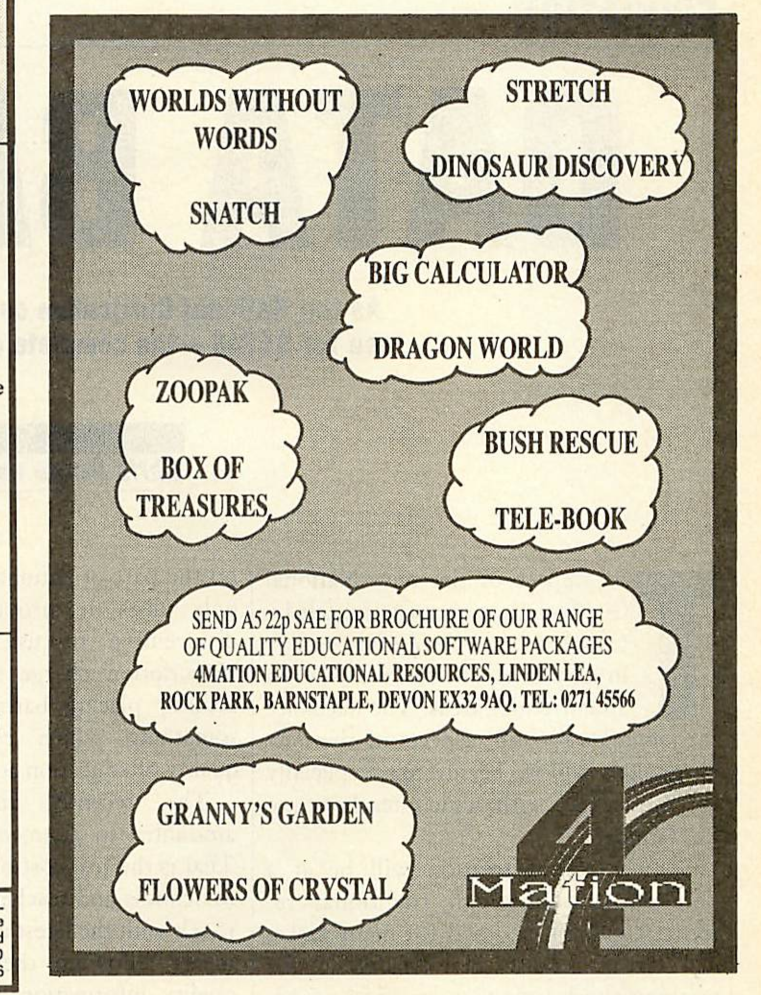
Dealer enquiries welcome

ORDERING DETAILS

Order with Access (0752) 847286

Prices include VAT, but please allow £1 postage (UK/BFPO). Access orders accepted on (0752) 847286, and official orders welcome.

IFEL
36 Upland Drive
Derriford
Plymouth PL6 6BD
(0752) 847286



MICRO MEDIA Computer Supplies Ltd.

ALL PRICES INC. OF DELIVERY AND VAT – ALL PRICES INC. OF DELIVERY AND VAT

5¼ Unbranded Discs

Price per	25	50	100	250
SS/DD	8.90	14.90	26.88	61.90
DS/40T	9.90	15.90	27.88	63.00
DS/80T	10.90	17.90	32.96	73.50
DS/HD PCAT's	23.90	39.90	73.88	173.20

5¼ Colour Discs (5 colours)

Price per	25	50	100	250
DS/40T	12.45	23.56	38.92	89.20
DS/80T	13.45	25.94	46.20	97.50

5¼ Reversible

Price per	25	50	100	250
DS/40 & 80T	14.50	26.94	49.48	107.20

Price per	10	20	50	100
3½ DS	10.90	20.94	46.15	86.00

5¼ MICRO MEDIA Brand Discs

SS/DD	5.75	10.90	25.50	46.50
DS/40T	6.75	12.74	29.85	57.20
DS/80T	8.50	15.96	36.25	71.30
DS/HD PCAT's	14.50	27.90	66.50	127.20
Reversible	8.50	15.96	36.25	71.30

All discs supplied are with labels 5¼" write protects, envelopes & hub rings, 100% certified error free. Lifetime guarantee.

3½ MICRO MEDIA Brand Discs

DS 135TPI	14.15	27.30	64.80	124.00
DS HD 2MB	36.90	70.60	167.95	311.50

Printer Ribbons

Price each Ribbon	2	6	12
Canon 1080/1156	2.99	2.85	2.60
R, BL, GR, BR, Y	3.99	3.85	3.70
Centronics GLP	3.65	3.45	3.15
R, BL, GR, BR, Y	4.65	4.40	4.00
Citizen 120D/LSP10	3.60	3.40	3.25
Epson M,F & RX80, F & LX800	2.99	2.75	2.55
R, BL, GR, BR	4.35	4.20	4.05
Epson LX80/86 GX80	2.80	2.65	2.40
R, BL, GR, BR, Y	3.80	3.65	3.40
Juki 6100 MS	2.85	2.70	2.60
R, BL, BR	2.95	2.80	2.70
Kaga KP810/910	2.99	2.85	2.60
R, BL, GR, BR, Y	3.99	3.85	3.70
NEC P2200	4.95	4.60	4.25
Panasonic KXP1080/1/2/3	3.99	3.80	3.60
R, BL, GR, BR	6.50	6.20	5.85
Shinwa CP80MS	3.99	3.80	3.60
Star NL10	4.95	4.60	4.25
R, BL, GR, BR	6.15	5.85	5.55
Star LC10	3.50	3.10	2.85
R, BL, GR, BR	4.90	4.60	4.25
Star LC24-10	3.99	3.80	3.60

Please mix colours and types for best prices.
R = Red, BL = Blue, GR = Green, BR = Brown, Y = Yellow

If the ribbon you require is not listed please let us quote.

Computer Paper

Plain fanfold, micro perf edges

Size	Weight gsm	1000's per bx	Price per box 1 box	3 bxs	5 bxs
11x9½	60	2000	14.95	14.45	13.65
11x9½	70	2000	18.45	16.05	15.15
11x9½	80	2000	20.25	18.55	16.45
A4 11⅔x9¼	70	2000	20.95	19.70	18.45
A4 11⅔x9¼	80	2000	24.55	23.05	20.15
A4 11⅔x9¼	90	1000	14.25	13.15	14.15

Computer Labels

Continuous fanfold, sprocket fed

Price per 1000	1000	3000	5000
70 x 36 2¾x1 7/16	4.85	3.85	3.55
89 x 36 3½x1 7/16	5.35	4.50	4.10
89 x 49 3½x1 15/16	6.60	5.90	5.40

Please state no of labels across sheet (1, 2 or 3)

Disc Storage Boxes

Price each	1+	3+	6+
MD 120 5¼ x 120	9.95	8.95	7.60
MD 100 5¼ x 100	8.90	7.99	7.40
MD 50 5¼ x 50	6.10	5.65	4.80
MD 80 3½ x 80	8.90	7.99	7.40
MD 180 5¼ x 180	19.90	18.90	17.95
MD 150 3½ x 150	20.95	19.25	18.90

Printer Stands

Price each			
PS10 80 col	28.50	27.25	25.30
Wire 80 col	11.10	9.90	8.95

Swivel Bases

Price each			
12" 55 x 280 x 260 mm	11.90	10.40	9.60
14" 55 x 355 x 320 mm	13.50	11.80	10.90

HOW TO ORDER

BY PHONE







LEICESTER 0533 856622
OUT OF OFFICE HOURS (0533 858654)

BY POST (no stamp required) MICRO MEDIA, DEPT. AU, **FREEPOST** LEICESTER LE3 6ZQ

BY FAX LEICESTER 0533 858932

PERSONAL CALLERS LEICESTER – SORRY NO PERSONAL CALLERS
POTTERS BAR – PERSONAL CALLERS WELCOME – MICRO MEDIA, Rydal Mount, Baker St., Potters Bar, Herts. Mon to Fri 10.00am - 4.00pm

OFFICE HOURS Leic. Mon to Fri 8.30am - 6.30pm

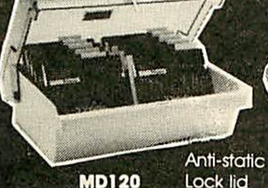
DESPATCH WITHIN 24 HRS
DELIVERY PLEASE ALLOW 5 DAYS

For guaranteed next day delivery please phone – from £2.50 EXTRA. Postage covers UK only.

MINIMUM ORDER VALUE

FOR PAYMENT WITH ORDER MIN VALUE £8.90 or £1.50 HANDLING CHARGE.
FOR ACCOUNT CUSTOMERS MIN VALUE £15.00 or £3.00 HANDLING CHARGE.

SPRING CATALOGUE OUT NOW
PLEASE RING OR WRITE FOR YOUR FREE COPY



Anti-static Lock lid

MD120 5¼ x 120 **MD100** 5¼ x 100 **PS10**

MD180 Interconnecting, Stackable MD180 5¼ x 180 MD150 3½ x 150

Swivel Base Adjusts by front dial turns 360° Tilt up & down 25°

-MICRO MEDIA- TEL: LEICESTER 0533 856622 -MICRO MEDIA- **BBC ACORN USER SHOW STAND 23** -MICRO MEDIA-

DATA BANKING

As the National Curriculum comes into force, you may find use for NERIS – the complete on-line database for teachers

Chris Drage and Nick Evans

The impact of the new National Curriculum is about to be felt by teachers across the entire country in all phases of education and in all curricular areas. The necessity for materials to fulfil aspects of the new curriculum will be keenly felt, especially in those areas with which teachers are less familiar.

Sources of information will be at a premium and although traditional resources will still be valid for many tasks, new areas require new materials for teaching and learning. A significant (and, at present, government-funded) enterprise is NERIS, the National Educational Resources Information Service.

What is NERIS?

Neris has been set up to provide teachers with on-line access to curricular information, resources and references. 'On-line' means that it is accessible by means of a computer and modem via a telephone line to another large-scale machine at a remote place – in this case, the Open University computer.

Once the user is connected to the NERIS system, it is possible to sift through its records and abstract either actual teaching materials, which may be downloaded and saved into the user's wordprocessor, or references to material available from other sources.

Currently, NERIS is used by about 4500 institutions or individuals and it has upwards of 17,500 records on file with new records being added at the rate of 1000 to 1500 each month. NERIS is run by the NERIS Trust which is grant-aided by the Department of Trade and Industry but the DTI has announced its intention to withdraw its support gradually up to 1992 when the system is designated to be self-supporting.

This appears to be a small-minded plan on the part of national government. Not only does it provide an immediate disincentive to use by proposing a subscription charge but government is actually placing barriers in the way of something which could enhance the quality of education across the board.

The recently announced funding amounted to £410,000 over three years. That is the real cost of providing support to schools and teachers, keeping them in touch with the latest educational developments, allowing them access to high-quality information. The same funding also promotes the employment of the new educational technology which we proudly claim to lead the world. If all this is true then it seems a very small price to pay per year in terms of the government's expenditure on other projects which, in some people's eyes, might seem more trivial.

In fact, £20,000 of this year's allocation is being spent on a research project, run by NCET (National Council for Educational Technology) which aims to assess the needs of the users in terms of the service being provided and the relationship of the service to the National Curriculum. In this it is identifying what new information or restructuring of existing data will be necessary 'to accommodate the attainment targets, programmes of study and the framework for assessment and testing'.

Gaining access to NERIS is easy enough, particularly if you already use on-line systems such as Telecom Gold, Campus 2000 (TTNS) or PRESTEL. It used to be possible to move directly into NERIS from TTNS but that service closed as of March 31, 1989. However, to gain access via Prestel, it is simply a matter of typing *NERIS which will then open up the NERIS system with no additional charge to the user.

It is also possible to dial direct into the system but for that you must have a user number and a password. These are available from your LEA NERIS co-ordinator free of charge provided you are a bona fide educational user.

If all else fails, it is possible to buy direct access for £35 from NERIS itself. The only further cost to the user is the telephone call necessary to link the computers together.

Information

It should be made clear at this point that the information available on NERIS is biased towards the secondary school. However, much of it is of equal relevance to the upper primary areas as well. Almost certainly one of the outcomes of the NCET research project will be to recommend that the scope of the database is extended to include a good deal more primary references.

Each record consists of a number of headings or 'fields' which contain specific information. Therefore any record will specify basic bibliographic information about the resource being examined in the following format:

Title	as published
Media	type of medium
Author	or editor, designer or producer
Series	series title
Publisher	name of publisher
Published	date of publication

There then follows descriptive information relating to the content and the material's availability (suppliers, prices, etc). A further field may contain an abstract from the resource, a summary of keywords which may be used in retrieving the record from the datafile or even the entire resource itself.

So, it is possible for the user to select records according to a number of criteria and either print them directly or

download the entire resource for later processing from disc.

Naturally, a large and growing body of information such as NERIS does not just generate itself. With the best will in the world, the co-ordinators and researchers at NERIS would not be able to discover, develop and process the volumes of specialist curricular materials that are already present on the system. It has been necessary to gain the support of suitable educational organisations and industry to provide information.

Using the system

There are two levels at which the user can gain access to NERIS's information. At the simple search level, three criteria are entered to determine the Interest Area of your search, the Media which you are interested in and the Age Phase of the pupils at whom the information is to be aimed.

The query is defined on the screen by filling in the data at the relevant place and setting the search in motion. The system then indicates the number of references found and the headings under which they appear. This enables the user to see not only the areas they think are associated with the chosen topic but also other related areas which may not have occurred to them.

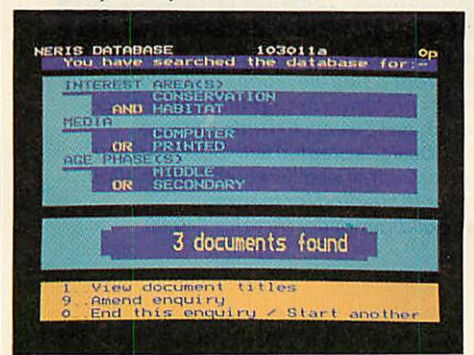
An alphabetic wordlist which provides a direct access to topics of interest is also available. More interestingly perhaps, there is a thesaurus facility available with the Extended Search system which allows teachers to examine related themes and topics that spring out of their original choice. This facility is invaluable in developing topic work and relating cross-curricular issues.

Like any new system available for schools, there is a training overhead which must be met by the school or by LEA training organisations. NERIS provides a range of support materials to allow both local and regional INSET courses to be undertaken.

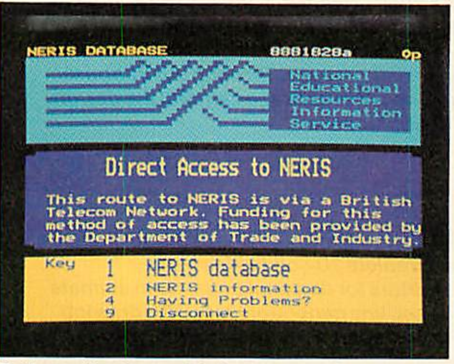
The NERIS *Videotex Guide* (£3.50) is a tutorial which helps users get to grips with the system through a progressive and well-illustrated set of materials. To augment that, there is the NERIS *Tutorial Software* which allows the users to have experience of NERIS off-line – that is, without being connected to the Open University computer – this can save on phone bills. *Marvel II* is the software which provides the facilities to download NERIS files and prepare them for word processing. It will handle graphics, text and data files and works on the BBC micro and Nimbus.

Partners for Learning is a document written by teachers in North Yorkshire which catalogues the progress of individuals in their use of NERIS and the ways in which it has enhanced their teaching. This document is particularly valuable in examining issues raised by the introduction of this type of technology.

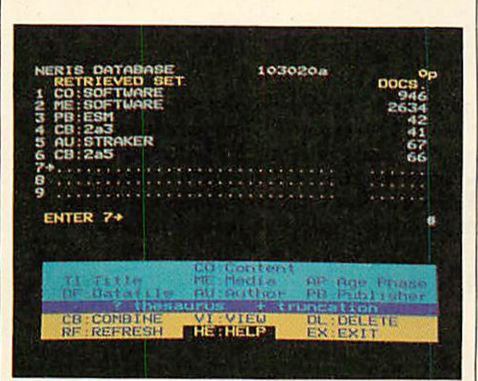
All of these items are contained in some quantity in both of the main



NERIS: database on-line to Open University



Both academics and industry contribute data



The system is also available on CD Rom

training resources provided by NERIS: The *NERIS INSET Pack* (£55 +VAT) contains 10 copies of each of the search guides and reference cards as well as a copy of the tutorial software, *Marvel II* and the two copies of *Partners for Learning*. Whereas the *NERIS School Starter Pack* (£30 +VAT) contains two reference cards, two search guides, two copies of *Partners for Learning* as well as the tutorial software and *Marvel II*.

All of the above are available from the NERIS address.

CD-Rom

Of course, not everyone has the facilities to go on-line. If this is the case there is a stand-alone version of NERIS which is updated on a regular basis.

This is the CD-Rom version which, although not yet present as a system facility in many places as yet, is likely to become a major educational resource in the near future. CD-Rom uses compact disc technology, not for music, but for the storage and retrieval of data.

Huge quantities of information may be stored on one disc and this may be accessed using a computer and a suitable CD drive. Unfortunately it is not simply a matter of connecting the music department's CD up to the BBC B. However, the price of the equipment is falling rapidly and the availability of such useful resources as NERIS as well as other systems which are in the pipeline, makes the potential of CD-Rom in schools very high indeed. Using the CD-ROM version of NERIS, it is possible to abstract resources from the CD and transfer them to floppy disc for use in the classroom.

In order to use this system a true IBM PC compatible is needed with 512K of memory, a single disc drive and monochrome display. The software is driven with a mouse and output can be sent to disc or to an Epson compatible printer.

NERIS is one of the most important resources developed for education in the last 20 years. It is growing all the time and there are plans to provide easy access so information can be supplied to the database as well as retrieved

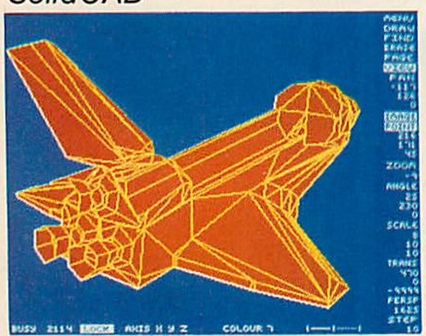
The success of the venture will depend upon the commitment of either the national funding or the LEAs to providing finance to keep the system active at a reasonable level. Like all other things, if it is to rely on schools' direct funding then it is unlikely to be supported, other than in a patchy fashion.

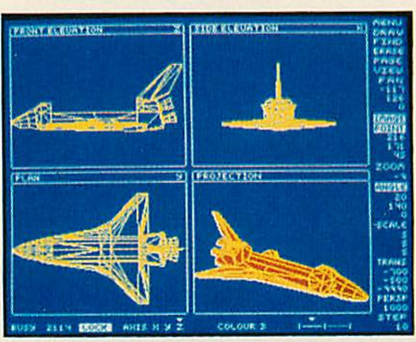
If schools had to pay libraries to use their books then the level of use of topic sets and bulk loans would diminish rapidly. NERIS must be supported, exploited in conjunction with the needs of the National Curriculum and brought into the line of sight of as many teachers as is possible.

SILICON VISION

SOFTWARE FOR THE ARCHIMEDES & BBC

SolidCAD





The ultimate 3D Draughting System for Architectural design, Interior design, Engineering Design and Teaching CDT. Allows drawing in plan, front & side elevations and also directly in 3D view. Includes powerful zoom & pan options for precision draughting and surface definition for creating solid colour objects. Also includes Sweep, Extrude & Macro facilities for designing very complex objects easily. Designs created with SolidCAD are compatible with the Realtime Graphics Language for high-speed flicker-free animation. The custom Archimedes version also performs smooth shading for realism. SolidCAD(Arc) users can upgrade to the Realtime Solids Modeller (Arc) for £40.00.

£49.95 (ARC or BBC B/B+/Master), New

REALTIME SOLIDS MODELLER

The package includes both the sophisticated design environment of SolidCAD and the high speed animation capability of a Realtime Graphics Language (RGL) module developed in pure ARM Risc code for supercharged performance. The package is ideal for Architectural design, Interior design, Engineering design & teaching CDT. The RGL module can be used to create standalone flicker-free animation of designs from your own programs. Smooth shading is also performed for realistic images. Through our in-house expertise in 3D Design and High-speed techniques, no other package can rival the design environment & animation speed of the Realtime Solids Modeller.

£89.95 (ARC) New

REALTIME GRAPHICS LANGUAGE

The Realtime Graphics Language rom provides a complete 3D Solids/Wireframe animation system with 52 star commands and 3D Editors for designing objects to animate from your own programs. Includes a 35,000 pixels / sec line generator for fast 3D drawing rates, 3D Rotate, Scale, Orbit, Perspective and Turtlegraphics. Also compatible with designs created with SolidCAD (BBC).

£49.95 (BBC B/B+/Master)

SUPER-DUMP

The ultimate printer driver which takes advantage of the highest resolution capability of ordinary Epson compatible printers to provide 1920×1024 resolution. Images can also be scaled, positioned and previewed before printing. Fully compatible with SolidCAD, Realtime Graphics Language, Gate-Array design system & 3D CAD/Animation system. Your own graphics programs or other CAD packages can be made compatible with Super-Dump by the addition of a few simple commands. An example program is included in the package.

£15.95 (BBC B/B+/Master), £24.95 (ARC) New

Presentation System

The package provides an interactive environment to create, edit and play-back computer controlled presentations for lectures and demonstrations. Also handles graph plotting for polynomials & user-defined functions which can be incorporated within the presentations.

£34.95 (BBC B/B+/Master), £49.95 (ARC) New

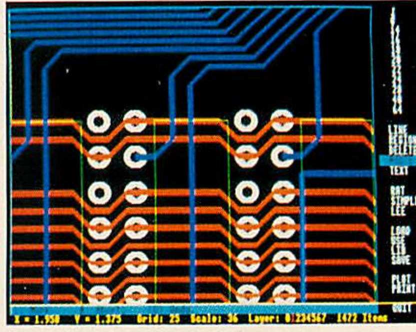
All Archimedes software run in native mode on A305 – A440 & A3000 with Arthur 1.2 or RISC OS

SILICON VISION LTD, SIGNAL HOUSE, LYON ROAD, HARROW MIDDLESEX HA1 2AG. TEL: 01-422 2274 or 01-861 2173 FAX: 01-427 5169. TELEX: 918266 SIGNAL G.

(Access/Mastercard/Eurocard accepted)

All prices include VAT and Carriage (Overseas orders add £4).

ARC-PCB



The ultimate PCB design system developed specifically for the Archimedes with a specification that cannot be matched. Includes Automatic routing, Rats-nesting, 8 layers, Surface mount capability, 0.001" resolution, 32"×32" maximum board size, On-line Help, Fast Zoom/Pan/Redraw, Text & Silkscreen facility, Variable Line/Pad/Text/Grid sizes, Part Libraries, Block Move/Copy/Rotate/Mirror/Erase options, and up to 300,000 components.

For hardcopy, the system supports the industry standard HP-GL, GRAPHTEC, PLOTMATE plotters and printers at their highest resolutions. Also provides automatic drilling information with extensive support from PCB manufacturers for final layout and production, optional 1 year telephone Hotline support (£100) and software maintenance service (£75) is also available.

£195.00 (ARC) New

Risc BASIC

The first true BASIC V syntax compiler which will convert your programs into supercharged Risc code for turbo performance leaving the competition standing. Features include Relocatable modules, full cross references, Double precision floating point & Integer support, in-line assembly, Window-based or command line compilation environment, standalone code generator, object code optimiser, full array manipulation and dimensions support, multiple exit structures & full runtime error handler.

£99.95 (ARC) New

RiscFORTH

A new 32-bit implementation of the FORTH-83 standard, designed to take full advantage of the ARM architecture. Features include Multi-tasking, Optimising compiler, built-in ARM assembler with floating point mnemonics, built-in Full screen Editor, File system interface, OS calls support, Floating point & Integer maths, WIMP support, Single-step debugger, Shadow screen for documentation, Block manipulation, Dictionary & Vocabulary display, Call finding and a standalone code generator.

£99.95 (ARC) New

YELLOW PAGES

COMPATIBILITY

Program	Page	BBC B	B+/128	Master 128	Master Compact	Electron	Arc	6502SP/ Turbo	ADFS	Econet	Shadow RAM	Monthly T/D
Arc Agora	22											
Listings 1-3							■		■	■	■	■
Hints & Tips	25											
Listings 1-2		■	■	■	■	■		■	■	■	■	■
Listings 3-7(1)				■	■			■	■	■	■	■
Colliding Galaxies	58											
Listing 1			■	■	■		■	■	■	■	■	■
Check it out	65											
Listing 1(2)		■	■	■	■	■	■	■	■	■	■	■
Get the fax	72											
Listing 1			■	■	■		■	■	■		■	■

Note 1. Requires StopPress. 2. Requires Wordwise Plus.

ARC AGORA

See Archimedes Agora, page 22

Listing 1. Quicklines

```
   10 REM Agora - listing 1
   20 REM Fast lines
   30 REM by Phil Lewis
   40 REM for Archimedes only
   50 REM (c) BAU July 1989
   60 :
   70 MODE 13
   80 PRINT TAB(10);"Fast lines"
   90 PRINT ''"Do you want range checkin
g? (Y/N) ";
  100 REPEAT
  110 A%=GET AND 223
  120 UNTIL A%=89 OR A%=78
  130 flag=(A%=89)
  140 DIM code% 1000,vdu% 16
  150 !vdu%=149
  160 vdu%!4=-1
  170 SYS "OS_ReadVduVariables",vdu%,vdu
%+8
  180 CLS
  190 OFF
  200 sx=0:sy=1:ex=2:ey=3:col=4
  210 dx=12:dy=5:sty=6:et=7
  220 temp=8:sc=9:ad=10:base=11
  230 sp=13:link=14:pc=15
  240 FOR pass%=0 TO 2 STEP 2
  250 P%=code%
  260 [OPT pass%
  270 .line
  280 LDR base,screen
  290 CMPS sx,ex
  300 MOVGT temp,sx
  310 MOVGT sx,ex
  320 MOVGT ex,temp
  330 MOVGT temp,sy
  340 MOVGT sy,ey
  350 MOVGT ey,temp
  360 SUB dx,ex,sx
  370 SUBS dy,ey,sy
  380 MVNLT dy,dy
  390 CMPS ey,sy
  400 MOVGE sty,#1
  410 MVNLT sty,#0
  420 MOV et,#1
  430 CMPS dx,dy
  440 MOVGT sc,dx,LSR #1
  450 MOVLE sc,dy,LSR #1
  460 BLE loop2
  470 .loop1
  480 FNplot(flag)
  490 SUBS et,ex,sx
  500 BEQ end
  510 ADD sx,sx,#1
  520 SUBS sc,sc,dy
  530 BGE loop1
  540 ADDLE sc,sc,dx
  550 ADDLE sy,sy,sty
  560 B loop1
  570 .loop2
  580 FNplot(flag)
  590 SUBS et,ey,sy
  600 BEQ end
  610 ADD sy,sy,sty
  620 SUBS sc,sc,dx
  630 BGE loop2
  640 ADDLE sc,sc,dy
  650 ADDLE sx,sx,#1
  660 B loop2
  670 .end
  680 MOV pc,link
  690 :
  700 .screen
  710 EQUD vdu%!8
  720 ]
```

Continued ▶

◀ Arc Agora, listing 1 continued

```
730 NEXT pass%
740 TIME=0
750 FOR i%=1 TO 1000
760 GCOL 0,RND(255)
770 LINE RND(1279),RND(1023),RND(1279)
,RND(1023)
780 NEXT
790 t=TIME
800 PRINT "Basic took ";t/100;" secs -
press a key"
810 kk=GET
820 CLS
830 TIME=0
840 FOR i%=1 TO 1000
850 A%=RND(319)
860 B%=RND(255)
870 C%=RND(319)
880 D%=RND(255)
890 E%=RND(255)
900 CALL line
910 NEXT
920 t=TIME
930 PRINT "ARM code took ";t/100;" sec
s"
940 END
950 :
960 DEF FNplot(d%)
970 IF d% THEN
980 [OPT pass%
990 CMP sx,#320
1000 BCS P%+24
1010 CMP sy,#256
1020 BCS P%+16
1030 ]
1040 ENDIF
1050 [OPT pass%
1060 ADD ad,base,sy,ASL #6
1070 ADD ad,ad,sy,ASL #8
1080 STRB col,[ad,sx]
1090 ]
1100 =""
```

Listing 2. 'Print Using' simulation

```
10 REM Agora - listing 2
20 REM 'Print Using' procedures
30 REM by Nagpal Hoysal
40 REM for Archimedes only
50 REM (c) BAU July 1989
60 :
70 DEF PROCLPrintUsingHelp
80 PRINT ''
90 PRINT "PROCLPrintUsing(<string>,<s
tring>)"
100 PRINT "executes equivalent of PRIN
T USING... on other machines."'
110 PRINT "First string is of form '##
#.##;#.##:'"
120 PRINT " # represents a digit"
130 PRINT " . represents a decimal poi
nt"
140 PRINT " ; represents follow-on num
ber"
150 PRINT " : terminates sequence"
160 PRINT "Second string contains name
s of variables to be displayed."
170 PRINT ''
180 ENDPROC
190 :
200 DEF PROCLPrintUsing(Lu$,Lvarlist$)
210 LOCAL Lfieldwidth%,Ldecimalflag%,L
decimal%,L%
220 FOR L%=1 TO LEN(Lu$)
230 CASE ASC(MID$(Lu$,L%,1)) OF
240 WHEN 35:Lfieldwidth%+=1:IF Ldecima
lflag% THEN Ldecimal%+=1
250 WHEN 46:Lfieldwidth%+=1:Ldecimalfl
ag%=TRUE
260 WHEN 58:PROCLprint(Lfieldwidth%,Ld
ecimal%,Ldecimalflag%):ENDPROC
270 WHEN 59:PROCLprint(Lfieldwidth%,Ld
ecimal%,Ldecimalflag%):Lfieldwidth%=0:Ld
ecimalflag%=FALSE:Ldecimal%=0
280 ENDCASE
290 NEXT L%
300 ENDPROC
310 :
320 DEF PROCLprint(Lfieldwidth%,Ldecim
al%,Ldecimalflag%)
330 Lformat%=0
340 IF Ldecimalflag% THEN Lformat%=&20
000+(Ldecimal%*&100)
350 Lformat%+=Lfieldwidth%
360 @%=Lformat%
370 PRINT EVAL(LEFT$(Lvarlist$,INSTR(L
varlist$,";")-1));
380 Lvarlist$=MID$(Lvarlist$,INSTR(Lva
rlist$,";")+1)
390 ENDPROC
```

Listing 3. 'Print Using' demonstration

```
10 REM Agora - listing 3
20 REM 'Print Using' demo
30 REM by Nagpal Hoysal
40 REM for Archimedes only
50 REM (c) BAU July 1989
60 :
70 MODE 12
80 LIBRARY "Agora2"
90 PROCLPrintUsingHelp
100 DIM vars(4,4)
110 FOR x%=0 TO 4
120 FOR y%=0 TO 4
130 vars(x%,y%)=RND(1280)/10
140 NEXT y%
150 NEXT x%
160 PROCtest("##;####.#;####.#;####.#;
####.#:")
170 PROCtest("#.#;#####.##;#####.##;##
###.##;#####.##:")
180 END
190 :
200 DEF PROCtest(form$)
210 PRINT'"Format: ";form$'
220 FOR y%=0 TO 4
230 var$="y%;"
240 FOR x%=0 TO 4
250 var$+="vars("+STR$x%+","+STR$y%+")
;"
260 NEXT x%
270 PROCLPrintUsing(form$,var$)
280 PRINT
290 NEXT y%
300 ENDPROC
```

Listing 4. Digital snow

```
10 REM Agora - listing 4
20 REM Snow doodle
30 REM by Dave Lawrence
40 REM for Archimedes only
50 REM (c) BAU July 1989
60 :
70 ON ERROR IF INKEY-1 OR ERR<>17 MODE 0:PRINTREPORT$" at line ";ERL:END ELSE RUN
80 MODE 13
90 OFF
100 dots=800
110 DIM code 320,table dots*20
120 !code=148:code!4=-1
130 SYS "OS_ReadVduVariables",code,code
140 scrst=!code
150 xmax=80:ymax=20
160 max=5:pixels=320
170 log=9
180 :
190 temp0=0:temp1=1
200 old=2:col=3:dir=4:speed=5:flag=6
210 addr=7:count=8:seed=9
220 xor=10:zero=11:times=12
230 sp=13:link=14:pc=15
240 FOR pass%=0 TO 2 STEP 2:P%=code
250 [OPT pass%
260 .go
270 MOV zero,#0
280 LDR seed,aseed
290 LDR xor,axor
300 .fall
310 MOV temp0,#19
320 SWI "OS_Byte"
330 MOV count,#dots
340 ADR addr,table
350 .foreach
360 LDMIA addr,{old,col,dir,speed,flag}
370 MOV times,speed
380 .again
390 LDRB temp0,[old,#pixels]
400 CMP temp0,#0
410 MOVEQ dir,#pixels
420 CMP dir,#0
430 BNE notwaiting
440 SUBS flag,flag,#1
450 BNE waiton
460 .rand
470 MOV temp0,#0
480 MOV temp1,#log
490 .rand1
500 MOVS seed,seed,LSL #1
510 EORCS seed,seed,xor
520 ADC temp0,temp0,temp0
530 SUBS temp1,temp1,#1
540 BNE rand1
550 ADD temp0,temp0,#2
560 CMP temp0,#pixels
570 BGE rand
580 LDR old,tlhc
590 ADD old,old,temp0
600 MOV dir,#pixels
610 B stop
620 .notwaiting
630 LDRB temp0,[old,dir]
640 CMP temp0,#0
650 BEQ move
660 MOVS seed,seed,LSL #1
670 EORCS seed,seed,xor
680 MOVCC dir,#1
690 MVNCS dir,#0
700 LDRB temp0,[old,dir]
710 CMP temp0,#0
720 BEQ move
730 RSB dir,dir,#0
740 LDRB temp0,[old,dir]
750 CMP temp0,#0
760 BEQ move
770 MOV dir,#0
780 MOV flag,#4
790 B waiton
800 .move
810 STRB zero,[old]
820 STRB col,[old,dir]!
830 .stop
840 SUBS times,times,#1
850 BNE again
860 .waiton
870 STMIA (addr)!,{old,col,dir,speed,flag}
880 SUBS count,count,#1
890 BNE foreach
900 SWI "OS_ReadEscapeState"
910 BCC fall
920 MOV pc,link
930 :
940 .tlhc
950 EQUD scrst+pixels-1
960 .aseed
970 EQUD TIME
980 .axor
990 EQUD &1D872B41
1000 ]
1010 NEXT pass%
1020 :
1030 RECTANGLE 0,0,1279,1023
1040 *POINTER 1
1050 REPEAT
1060 MOUSE x1,y1,z
1070 IF z AND 4 THEN
1080 MOVE x1,y1
1090 REPEAT
1100 MOUSE x2,y2,z
1110 DRAW x2,y2
1120 UNTIL z=0
1130 ENDIF
1140 IF z AND 2 THEN
1150 MOVE x1,y1
1160 MOVE BY RND(xmax*2)-xmax,RND(ymax*2)-ymax
1170 PLOT 81,RND(xmax*2)-xmax,RND(ymax*2)-ymax
1180 REPEAT
1190 MOUSE x,y,z
1200 UNTIL z=0
1210 ENDIF
1220 UNTIL z AND 1
1230 *POINTER 0
1240 FOR i%=0 TO dots-1
1250 REPEAT
1260 ad=scrst+RND(10*pixels)
1270 UNTIL ?ad=0
1280 !(table+i%*20)=ad
1290 !(table+i%*20+4)=RND(256)
1300 !(table+i%*20+8)=pixels
1310 IF max=1 vel=1 ELSE vel=RND(max)
1320 !(table+i%*20+12)=vel
1330 NEXT
1340 CALL go
```

See Hints & Tips, page 26

Listing 1. AMX to NLQ converter

```
   10 REM NLQ Font conversion
   20 REM by Robin Barnes
   30 REM for B/B+/E/M/C
   40 REM (c) Acorn User Jul 89
   50 :
   60 MODE 7
   70 descend$="gjpqy"
   80 VDU 23,1,0;0;0;0;
   90 INPUT "Please Enter Font name :-"n
ame$
  100 INPUT "Please Enter save name :-"s
ave$
  110 CLS
  120 PROCcode
  130 PROCload(name$)
  140 PROCconvert
  150 PROCsend
  160 END
  170 :
  180 DEF PROCcode
  190 *FX 3,6
  200 DIM mc% 100
  210 FOR opt%=0 TO 2 STEP 2
  220 P%=mc%
  230 [
  240 OPT opt%
  250 .start
  260 LDY #0
  270 LDA #0
  280 .loop
  290 CLC
  300 ASL &70
  310 ROL A
  320 ASL &71
  330 ROL A
  340 ASL &72
  350 ROL A
  360 ASL &73
  370 ROL A
  380 ASL &74
  390 ROL A
  400 ASL &75
  410 ROL A
  420 ASL &76
  430 ROL A
  440 ASL &77
  450 ROL A
  460 STA &78,Y
  470 INY
  480 CPY #&08
  490 BNE loop
  500 LDY #0
  510 .replace
  520 LDA &78,Y
  530 STA &70,Y
  540 INY
  550 CPY #8
  560 BNE replace
  570 RTS
  580 :
  590 ]
  600 NEXT opt%
  610 *FX 3,0
  620 ENDPROC
  630 :
  640 DEF PROCload(name$)
  650 OSCLI ("LOAD "+name$+" 6FBA")
  660 ENDPROC
  670 :
  680 DEF PROCconvert
  690 start%=&7000
  700 end%=&7B40
  710 PRINT "Please wait for data to be
reformatted"
  720 FOR conv%=start% TO end% STEP 16
  730 PROCrotate(conv%)
  740 NEXT conv%
  750 PRINT "Generating new character se
t"
  760 ENDPROC
  770 :
  780 DEF PROCrotate(start%)
  790 FOR next%=0 TO 1
  800 strt%=start%+next%
  810 FOR loop%=0 TO 15 STEP 2
  820 byte%=?(strt%+loop%)
  830 ?(&70+(loop% DIV 2))=byte%
  840 NEXT loop%
  850 CALL start
  860 FOR loop%=0 TO 7
  870 byte%=?(&70+loop%)
  880 add%=&6000+((start%-&7000)+(next%*
8))
  890 ?(add%+loop%)=byte%
  900 NEXT loop%
  910 NEXT next%
  920 ENDPROC
  930 :
  940 DEF PROCsend
  950 FOR loop%=34 TO 124
  960 PROCredefine(loop%)
  970 NEXT loop%
  980 OSCLI("SAVE "+save$+" 4000+10E0 60
00")
  990 ENDPROC
 1000 :
 1010 DEF PROCredefine(char%)
 1020 add%=char%-34
 1030 address%=&6000+(add%*32)
 1040 store%=&4000+(add%*48)+2
 1050 PROCreformat(2,0,3)
 1060 PROCreformat(4,4,10)
 1070 PROCreformat(2,11,15)
 1080 store%=&4000+(add%*48)+2
 1090 descd%=ABS(NOT INSTR(descend$,CHR$
(char%))>0)
 1100 start%=-1:end%=-1
 1110 FOR chk%=0 TO 23
 1120 byte%=?(store%)+?(store%+1)
 1130 IF byte%>0 AND start%=-1 THEN star
t%=chk%
 1140 IF byte%=0 AND start%>-1 AND end%=
-1 AND chk%>start%+5 THEN end%=chk%
 1150 store%=store%+2
 1160 NEXT chk%
 1170 start%=start%-2
 1180 end%=end%+2
 1190 IF start%>14 THEN start%=14
 1200 IF end%>23 THEN end%=23
 1210 IF start%<0 THEN start%=0
 1220 IF end%<0 THEN end%=23
 1230 store%=&4000+(add%*48)
 1240 ?store%=start%+(descd%*128)
 1250 ?(store%+1)=end%
 1260 ENDPROC
 1270 :
 1280 DEF PROCreformat(step%,strt%,end%)
 1290 FOR str%=strt% TO end%
 1300 high%=?(address%+str%)
 1310 low%=?(address%+&10+str%)
 1320 ?store%=high%
 1330 ?(store%+1)=low%
 1340 IF step%>2 THEN ?(store%+2)=high%
 1350 IF step%>2 THEN ?(store%+3)=low%
 1360 store%=store%+step%
 1370 NEXT str%
 1380 ENDPROC
```

YELLOW PAGES
HINTS & TIPS

Listing 2. Font Test

```
   10 REM NLQ Font Test
   20 REM by Robin Barnes
   30 REM for B/B+/E/M/C
   40 REM (c) Acorn User Jul 89
   50 :
   60 MODE 7
   70 VDU 23,1,0;0;0;0;
   80 INPUT "Please enter font name : "
name$
   90 INPUT "Test alphabet (Y/N) " test$
  100 T%=(test$="Y")
  110 PROCprint(name$)
  120 IF T%=0 GOTO 210
  130 *FX 3,10
  140 VDU 27,37,1,0,27,112,1
  150 FOR prt%=34 TO 123
  160 VDU prt%
  170 IF (prt%-33)MOD 45=0 THEN VDU 10,1
3
  180 NEXT prt%
  190 VDU 10,13
  200 *FX 3,0
  210 END
  220 :
  230 DEF PROCprint(name$)
  240 OSCLI("LOAD "+name$+" 6000")
  250 *FX 3,10
  260 VDU 27,64
  270 VDU 27,40
  280 IF T% PRINT 'name$;" - "'
  290 char%=34
  300 FOR loop%=&6000 TO &70E0 STEP 48
  310 VDU 27,38,0,char%,char%
  320 FOR stp%=0 TO 47
  330 VDU ?(loop%+stp%)
  340 NEXT stp%
  350 VDU 0,0
  360 char%=char%+1
  370 NEXT loop%
  380 *FX 3,0
  390 ENDPROC
```

Listing 3. *Basic maker

```
   10 REM * BASIC MAKE
   20 REM by D Aylott
   30 REM for M/C
   40 REM (c) Acorn User
 Jul 89
   50 :
   60 argc=&70
   70 PROCoscalls
   80 DIM gap% 200
   90 PROCassemble("M.CO
DE",gap%,gap%)
  100 END
  110 :
  120 DEF PROCoscalls
  130 gsinit=&FFC2
  140 gsread=&FFC5
  150 oswrch=&FFEE
  160 osbyte=&FFF4
  170 ENDPROC
  180 :
  190 DEF PROCassemble(F
$,laddr%,eaddr%)
  200 LOCAL pass%,P%,O%
  210 FOR pass%=4 TO 6 S
TEP 2
  220 P%=eaddr%:O%=laddr
%
  230 [OPT pass%
  240 LDA #0
  250 STA argc
  260 LDA #138
  270 LDX #0
  280 LDY #79
  290 JSR osbyte
  300 LDY #76
  310 JSR osbyte
  320 LDY #68
  330 JSR osbyte
  340 LDY #13
  350 JSR osbyte
  360 LDY #82
  370 JSR osbyte
  380 LDY #85
  390 JSR osbyte
  400 LDY #78
  410 JSR osbyte
  420 LDY #13
  430 JSR osbyte
  440 LDY #0
  450 .arg
  460 SEC
  470 JSR gsinit
  480 BEQ exit
  490 INC argc
  500 .count
  510 JSR gsread
  520 BCS endcnt
  530 CMP #&20
  540 BEQ next
  550 PHY
  560 TAY
  570 LDA #138
  580 LDX #0
  590 JSR osbyte
  600 TYA
  610 PLY
  620 BRA count
  630 .next
  640 LDA #&D
  650 PHY
  660 TAY
  670 LDA #138
  680 LDX #0
  690 JSR osbyte
  700 TYA
  710 PLY
  720 BRA arg
  730 .endcnt
  740 LDY #13
  750 LDA #138
  760 LDX #0
  770 JSR osbyte
  780 .exit
  790 RTS
  800 ]
  810 NEXT pass%
  820 OSCLI("SAVE "+F$+"
 "+STR$~(laddr%)+" "+STR
$~(O%)+" "+STR$~(eaddr%)
)
  830 ENDPROC
```

Listing 4. *Basic converter

```
   10 REM * BASIC CONVERT
   20 REM by D Aylott
   30 REM for M/C only
   40 REM (c) Acorn User Jul 89
   50 :
   60 MODE 135
   70 DIM B% &4000
   80 INPUT "BASIC program name  : " B$
   90 INPUT "Save '*' version as : " S$
  100 IF S$="" THEN S$="S."+B$
  110 X%=OPENIN B$
  120 IF X%=0 THEN PRINT "Can't find ";B
$:END
  130 L%=EXT# X%
  140 top%=B%+L%
  150 CLOSE# X%
  160 PROCo("LOAD "+B$+" "+STR$~B%)
  170 PROCo("LOAD M.CODE "+STR$~top%)
  180 PROCo("SAVE "+S$+" "+STR$~B%+" "+S
TR$~(top%+&6A)+" "+STR$~(PAGE+L%)+" "+ST
R$~PAGE)
  190 PRINT "Program converted : type *"
;S$;" <parameters ....> to run"
  200 END
  210 :
  220 DEF PROCo(a$)
  230 PRINT a$
  240 OSCLI a$
  250 ENDPROC
```

Listing 5. Demonstration 1

```
   10 REM * BASIC PROG1
   20 REM by D Aylott
   30 REM for M/C
   40 REM (c) Acorn User Jul 89
   50 :
   60 MODE 7
   70 PRINT'"This is PROG1"
   80 INPUT'"How many parameters to pass
 ",A%
   90 p$="PROG2"
  100 IF A%<1 GOTO 180
  110 FOR I%=1 TO A%
  120 INPUT'"Enter a parameter: " a$
  130 p$=p$+" "+a$
  140 NEXT I%
  150 PRINT''"These parameters will now
be passed"
  160 PRINT"to the second program where
they"
  170 PRINT"will be printed out."
  180 PRINT''"Press any key to contine..
.";
  190 *FX 21,0
  200 REPEAT UNTIL GET
  210 PAGE=&3000
  220 OSCLI(p$)
  230 END
```

Listing 6. Demonstration 2

```
   10 REM * BASIC PROG2
   20 REM by D Aylott
   30 REM for M/C
   40 REM (c) Acorn User Jul 89
   50 :
   60 argc%=?&70
   70 DIM A$(argc%)
   80 PROCrdargs(argc%)
   90 MODE 7
  100 PRINT ''"This is "A$(1)
  110 PRINT '"The ";argc%-1;" parameters
 which you passed were:"'
  120 PROCwrargs(argc%)
  130 PRINT
  140 PRINT "Now type 'CHAIN ""MENU""' or
 *MENU a1'."
  150 PRINT '"This demonstrates that an
existing"
  160 PRINT "program can be used without
 alteration."
  170 PRINT '"a1 is optional. 1,2,3 or 0
 are valid,"
  180 PRINT "other parameters are ignore
d."
  190 END
  200 :
  210 DEF PROCwrargs(A%)
  220 IF A%<2 THEN PRINT "None":ENDPROC
  230 FOR I%=2 TO A%
  240 PRINT A$(I%)
  250 NEXT I%
  260 ENDPROC
  270 :
  280 DEF PROCrdargs(A%)
  290 FOR I%=1 TO A%
  300 INPUT"" A$(I%)
  310 NEXT I%
  320 ENDPROC
```

Listing 7. Demonstration 3

```
   10 REM * BASIC MENU
   20 REM by D Aylott
   30 REM for M/C
   40 REM (c) Acorn User Jul 89
   50 :
   60 MODE 7
   70 REPEAT
   80 C%=FNmenu("DEMO")
   90 CLS
  100 IF C%=1 THEN PRINT "First choice"
  110 IF C%=2 THEN PRINT "Second choice"
  120 IF C%=3 THEN PRINT "Third choice"
  130 IF C%<>0 THEN PROCspace
  140 UNTIL C%=0
  150 PRINT "Goodbye"
  160 END
  170 :
  180 DEF PROCheading(H$)
  190 LOCAL A%,M%,X%,W%,char$
  200 W%=40
  210 char$="-"
  220 M%=FNmode
  230 IF M%=0 OR M%=3 THEN W%=80
  240 IF M%=2 OR M%=5 THEN W%=20
  250 IF M%=7 THEN char$="_"
  260 CLS
  270 X%=((W%-LEN(H$))DIV2)-2
  280 PRINT STRING$(W%,char$);STRING$(X%
,"*");"> "H$" <"STRING$(W%-POS,"*");STRI
NG$(W%,char$)
  290 ENDPROC
  300 :
  310 DEF FNmode
  320 LOCAL A%
  330 A%=135
  340 =(USR &FFF4 AND &F0000) DIV &10000
  350 :
  360 DEF FNreply(R$,P%,R%)
  370 LOCAL reply%,get%
  380 REPEAT
  390 REPEAT
  400 get%=GET
  410 reply%=INSTR(R$,CHR$(get%))
  420 UNTIL reply%
  430 IF P% THEN PRINT CHR$(get%);
  440 IF R% THEN REPEAT get%=GET:UNTIL g
et%=13 OR get%=127
  450 IF get%=127 AND P% THEN VDU127
  460 UNTIL get%<>127
  470 =reply%
  480 :
  490 DEF FNmenu(M$)
  500 LOCAL @%,A%,I%,C$
  510 @%=9
  520 I%=1
  530 RESTORE 690
  540 PROCheading(M$)
  550 PRINT'
  560 READ C$
  570 REPEAT
  580 PROCprint(I%,C$)
  590 I%=I%+1
  600 READ C$
  610 UNTIL C$=""
```

Continued ▶

◀ Hints & Tips, listing 7 continued

```
 620 PROCprint(0,"Leave the program")
 630 FOR A%=0 TO I%-1
 640 C$=C$+STR$(A%)
 650 NEXT
 660 PRINT''SPC(@%-1)"Your choice :";
 670 =FNreply(C$,TRUE,TRUE)-1
 680 :
 690 DATA First choice,Second choice,Th
ird choice,""
 700 :
 710 DEF PROCprint(P%,A$)
 720 PRINT P%;" - ";A$
 730 ENDPROC
 740 :
 750 DEF PROCspace
 760 LOCAL M%,X%,Y%
 770 *FX 21,0
 780 M%=FNmode
 790 IF M%=0 OR M%=3 THEN X%=24 ELSE IF
 M%=2 OR M%=5 THEN X%=2 ELSE X%=4
 800 IF M%=3 OR M%=6 OR M%=7 THEN Y%=24
 ELSE Y%=31
 810 IF M%=2 OR M%=5 THEN S$="Press SPA
CE bar" ELSE S$="Press the SPACE BAR to
continue"
 820 VDU 23,1,0;0;0;0;
 830 PRINTTAB(X%,Y%)S$;
 840 REPEAT UNTIL GET=32
 850 VDU 23,1,1;0;0;0;
 860 ENDPROC
```

See Colliding Galaxies, page 58

Listing 1. Galaxy collision simulator

```
  10 REM Galaxy Collision
  20 REM by Andrew Rankin
  30 REM for B+/M/C/A
  40 REM (c) BAU July 1989
  50 :
  60 MODE 128
  70 v$="1.02"
  80 DIM x(750),y(750),z(750),u(750),v(
750),w(750)
  90 galr=30:galm=5:galri=10:galc%=12
 100 mz%=2
 110 phase%=1:@%=&50A
 120 title$="COLLIDING GALAXIES SIMULAT
ION version "+v$
 130 REPEAT
 140 ONphase% PROCsetup,PROCsimulation
ELSE
 150 UNTIL phase%=3
 160 END
 170
 180 DEF PROCsetup
 190 CLS
 200 VDU 19,1,4;0;19,0,7;0;
 210 PRINT TAB(19,0)title$
 220 PRINT '"  This program  simulates
 the passing of  two galaxies  in close
proximity. To"
 230 PRINT "  simplify  calculations  o
f  star  positions  it is  assumed  that
 all  of the"
 240 PRINT "  galactic mass is at the c
entre and ignores the gravitational fiel
d due to the"
 250 PRINT "  surrounding  stars. It is
 assumed  the effects  of forces  other
than gravity"
 260 PRINT "  are negligible. The  targ
et  galaxy  is taken to be a disk of sta
rs in stable"
 270 PRINT "  circular  orbit with zero
  drift velocity  and the intruder  is t
aken to be a"
 280 PRINT "  point of comparable mass.
"
 290 :
 300 PRINT TAB(1,12)"SET UP:"TAB(1,13)"
 In the target galaxy:"
 310 INPUT TAB(10,14)"How many rings of
 stars are required ",rings%
 320 INPUT TAB(10,15)"How many stars pe
r ring are required ",stpr%
 330 stars%=stpr%*rings%:dr=(galr-galri
)/(rings%-1)
 340 PRINT "  The target galaxy is loca
ted at coordinates (0,0,0) with zero";
 350 PRINT " drift velocity,"
 360 PRINT "  and mass  5.0 mass units.
 ";stars%" stars rotate  in  circular ";
 370 PRINT "orbits of  10 to  30"'"  di
stance units."
 380 PRINT TAB(1,19)"For the intruder g
alaxy:"
 390 INPUT TAB(10,20)"Mass as a fractio
n (%) of target galaxy ",massfr
 400 INPUT TAB(10,21)"Distance from tar
get galaxy:"TAB(10,22)"X (-70 to 70) ? "
d
 410 INPUT TAB(33,22)"Y (-70 to 70) ? "
e TAB(56,22)"Z (-35 to 35) ? "f
 420 INPUT TAB(10,23)"Velocity componen
ts:"TAB(10,24)"X ?  "r TAB(33,24)"Y ?  "
s
 430 INPUT TAB(56,24)"Z ?  "t
 440 PRINT TAB(5,26)"Set up complete -
select (A)lter set up, (R)un simulation"
;
 450 PRINT ", (E)xit    [ ]"TAB(74,26);
 460 REPEAT
 470 ans$=GET$
 480 PRINT TAB(74,26)ans$;
 490 phase%=INSTR("ARE",ans$)
 500 UNTIL phase%>0
 510 stop%=-1
 520 ENDPROC
 530
 540 DEF PROCsimulation
 550 VDU 12,20,19,0,4;0;23,1,0,0,0,0,0,
0,0,0
 560 m=galm
 570 n=m*massfr/100
 580 a=150:b=100:c=0:d=a+d:e=e+b:f=f+c
 590 o=0:p=0:q=0
 600 T%=0:I%=0:sf=2
 610 PRINT TAB(19,0)title$TAB(15,1)"---
-----Target galaxy---------"
 620 PRINT TAB(49,1)"-------Intruder ga
laxy-------"
 630 PRINT TAB(17,2)"- start:"TAB(35,2)
"- now:"
 640 PRINT TAB(51,2)"- start:"TAB(69,2)
"- now:"
 650 PRINT TAB(1,3)"Mass"TAB(15,3)m TAB
(31,3)m TAB(49,3)n TAB(65,3)n
```

Continued ▶

◀ Colliding Galaxies, listing 1 continued

```
 660 PRINT TAB(1,4)"X coordinate"TAB(1,
5)"Y coordinate"TAB(1,6)"Z coordinate"
 670 PRINT TAB(1,7)"Velocity (X)"TAB(1,
8)"Velocity (Y)"TAB(1,9)"Velocity (Z)"
 680 PRINT TAB(1,11)"X-Y plane"TAB(41,1
1)"X-Z plane (Z shown x 2)"
 690 PRINT TAB(70,11)"Time"TAB(15,4)a T
AB(49,4)d TAB(15,5)b TAB(49,5)e
 700 PRINT TAB(15,6)c TAB(49,6)f TAB(15
,7)o TAB(49,7)r
 710 PRINT TAB(15,8)p TAB(49,8)s TAB(15
,9)q TAB(49,9)t TAB(75,11);T%
 720 FOR J%=0 TO rings%-1
 730 rad=J%*dr+galri
 740 vel=SQR(m/rad)
 750 theta=0.5*vel/rad
 760 IF J%=0 THEN vel=0.9*vel
 770 FOR K%=0 TO stpr%-1
 780 g=K%*2*PI/stpr%
 790 x(I%)=rad*COS(g)+150
 800 y(I%)=rad*SIN(g)+100
 810 z(I%)=0
 820 w(I%)=0
 830 v(I%)=vel*COS(g-theta)
 840 u(I%)=-vel*SIN(g-theta)
 850 I%=I%+1
 860 NEXT:NEXT
 870 PROCplotgalaxies
 880 PROCkey
 890 REPEAT
 900 FOR I%=0 TO stars%-1
 910 f1=m/((x(I%)-a)^2+(y(I%)-b)^2+(z(I
%)-c)^2+sf)^1.5
 920 f2=n/((x(I%)-d)^2+(y(I%)-e)^2+(z(I
%)-f)^2+sf)^1.5
 930 ax=f1*(a-x(I%))+f2*(d-x(I%))
 940 ay=f1*(b-y(I%))+f2*(e-y(I%))
 950 az=f1*(c-z(I%))+f2*(f-z(I%))
 960 u(I%)=u(I%)+ax
 970 v(I%)=v(I%)+ay
 980 w(I%)=w(I%)+az
 990 x(I%)=x(I%)+u(I%)
 1000 y(I%)=y(I%)+v(I%)
 1010 z(I%)=z(I%)+w(I%)
 1020 NEXT
 1030 rad=((a-d)^2+(b-e)^2+(c-f)^2+sf)^1
.5
 1040 ax=(d-a)/rad
 1050 ay=(e-b)/rad
 1060 az=(f-c)/rad
 1070 o=n*ax+o
 1080 p=n*ay+p
 1090 q=n*az+q
 1100 r=r-m*ax
 1110 s=s-m*ay
 1120 t=t-m*az
 1130 a=a+o
 1140 b=b+p
 1150 c=c+q
 1160 d=d+r
 1170 e=e+s
 1180 f=f+t
 1190 T%=T%+1
 1200 PROCplotgalaxies
 1210 key%=INKEY(5)
 1220 IF key%=80 OR T%=stop% PROCwait
 1230 IF key%=73 PROCiterate
 1240 IF key%=71 PROCsdump:key%=INKEY(5)
 1250 IF key%=83 phase%=1
 1260 IF key%=69 phase%=3
 1270 UNTIL phase%<>2
 1280 ENDPROC
 1290 :
 1300 DEF PROCplotgalaxies
 1310 PRINT TAB(31,4)a TAB(65,4)d TAB(31
,5)b TAB(65,5)e TAB(31,6)c TAB(65,6)f
 1320 PRINT TAB(31,7)o TAB(65,7)r TAB(31
,8)p TAB(65,8)s TAB(31,9)q TAB(65,9)t
 1330 PRINT TAB(75,11);T%
 1340 VDU 28,0,31,79,12,12,26
 1350 MOVE 640,0:DRAW 640,640
 1360 MOVE 0,640:DRAW 1279,640
 1370 g=(m*a+n*d)/(m+n)
 1380 h=(m*b+n*e)/(m+n)
 1390 i=(m*c+n*f)/(m+n)
 1400 :
 1410 VDU 26,24,0;0;640;640;
 1420 PROCc((a-g)*4.267+320,(h-b)*4.267+
320)
 1430 PROCd((d-g)*4.267+320,(h-e)*4.267+
320)
 1440 VDU 26,24,640;0;1279;640;
 1450 PROCc((a-g)*4.267+960,(i-c)*4.267*
mz%+320)
 1460 PROCd((d-g)*4.267+960,(i-f)*4.267*
mz%+320)
 1470 FOR I%=0 TO stars%-1
 1480 VDU 26,24,0;0;640;640;:PLOT 69,(x(
I%)-g)*4.267+320,(h-y(I%))*4.267+320
 1490 VDU 26,24,640;0;1279;640;:PLOT 69,
(x(I%)-g)*4.267+960,(i-z(I%))*mz%*4.267+
320
 1500 NEXT
 1510 ENDPROC
 1520 :
 1530 DEF PROCc(A%,B%)
 1540 LOCAL I%,a,b
 1550 PLOT 69,A%,B%
 1560 FOR I%=0 TO 3
 1570 a=galc%*COS(PI/8*I%)
 1580 b=galc%*SIN(PI/8*I%)
 1590 PLOT 69,A%+a*2,B%+b*2:PLOT 69,A%-b
*2,B%+a*2
 1600 PLOT 69,A%-a*2,B%-b*2:PLOT 69,A%+b
*2,B%-a*2
 1610 PLOT 69,A%+a,B%+b:PLOT 69,A%-b,B%+
a
 1620 PLOT 69,A%-a,B%-b:PLOT69,A%+b,B%-a
 1630 NEXT
 1640 ENDPROC
 1650 :
 1660 DEF PROCd(A%,B%)
 1670 LOCAL I%,a
 1680 MOVE A%+galc%,B%
 1690 FOR I%=1 TO 16
 1700 MOVE A%,B%
 1710 a=PI*I%/8
 1720 PLOT 85,A%+galc%*COS(a),B%+galc%*S
IN(a)
 1730 NEXT
 1740 ENDPROC
 1750 :
 1760 DEF PROCsdump
 1770 *FX 6,0
 1780 */C.SDUMP
 1790 ENDPROC
 1800 :
 1810 DEF PROCwait
 1820 PRINT TAB(68,10)"..waiting.."
 1830 REPEAT
 1840 key%=INKEY(5)
 1850 UNTIL key%<>-1
 1860 PRINT TAB(68,10)SPC(11)
 1870 ENDPROC
 1880 :
 1890 DEF PROCiterate
```

Continued ▶

◀ Colliding Galaxies, listing 1 continued

```
 1900 PRINTTAB(11,10)SPC68TAB(11,10)"Ite
rate until time = ";
 1910 INPUT,stop%
 1920 PROCkey
 1930 ENDPROC
 1940 :
 1950 DEF PROCkey
 1960 COLOUR 129:COLOUR 0
 1970 PRINT TAB(11,10)"(P)ause  (I)terat
ions  (G)raphics dump  (S)et up  (E)xit"
 1980 COLOUR 128:COLOUR 1
 1990 ENDPROC
```

See Check it out, page 65

Listing 1. Text checker segment

```
REM WW+ Text checker
REM by C Robbins
REM for B/B+/M/C/E with WW+
REM (c) BAU July 1989

GOTO main-program

.select-down
  VDU 31,0,Y%
  PRINT " "
  Y%=Y%+1
  IF Y%<=N% THEN GOTO select-next
  Y%=0
  VDU 31,0,Y%
  PRINT CHR$(93)
  CURSOR TOP
  ENDPROC

.select-next
  VDU 31,0,Y%
  CURSOR DOWN
  PRINT CHR$(93)
ENDPROC

.select-up
  VDU 31,0,Y%
  PRINT " "
  IF Y%>0 THEN GOTO select-prev
  Y%=N%
  VDU 31,0,Y%
  PRINT CHR$(93)
  CURSOR BOTTOM
  CURSOR AT 0
  ENDPROC

.select-prev
  Y%=Y%-1
  VDU 31,0,Y%
  CURSOR UP
  PRINT CHR$(93)
ENDPROC

.yes-no
  REPEAT
    R%=GET
    IF R%>89 THEN R%=R%-32
    A$=CHR$(R%)
  UNTIL A$="Y" OR A$="N" OR A$=R$ OR R%=
27
  IF R%=27 OR R%=13 THEN A$="N"
ENDPROC

.message
  VDU 31,39,24
  VDU 131,157,132
  PRINT M$
ENDPROC

.carry-on-check
  VDU 13
  PRINT "From Start/Current position ? (
S/C)"
  REPEAT
    R%=GET
    IF R%>89 THEN R%=R%-32
    A$=CHR$(R%)
  UNTIL A$="S" OR A$="C" OR A$=R$
  IF A$="S" THEN CURSOR TOP
ENDPROC

.same-word
  VDU 7
  DISPLAY
  M$="Duplicate - "+W$
  PROCmessage
  VDU 136
  PRINT "Continue Y/N ?"
  Y%=10
  IF EOT<>TRUE AND (C$=R$ OR ?126<2) THE
N Y%=9
  IF EOT THEN CURSOR RIGHT
  CURSOR LEFT LEN(W$)+1
  VDU 31,?126,Y%
  PROCyes-no
  IF A$="N" THEN PROCexit
  CURSOR RIGHT LEN(W$)+1
  DISPLAY
  M$="Check continuing"
  PROCmessage
  VDU 31,?126,11
ENDPROC

.same-character
  M%=M%+1
  IF M%>2 THEN GOTO same-multiple
  IF W$>"a" AND W$<"h" OR W$>"k" AND W$<
"q" OR W$>"q" AND W$<"u" OR W$="z" THEN
ENDPROC
  N$="Error ? - "
  PROCpossible-error
  ENDPROC

.same-multiple
  N$="Multiple character - "
  PROCpossible-error
ENDPROC

.possible-error
  VDU 7
  DISPLAY
  M$=N$+W$
  PROCmessage
  VDU 136
  PRINT "Continue Y/N ?"
  VDU 31,?126,10
  PROCyes-no
  IF A$="N" THEN PROCexit
  DISPLAY
  M$="Check continuing"
  PROCmessage
```

Continued ▶

◄ **Check It Out, listing 1 continued**

```
    VDU 31,?126,11
  ENDPROC

  .space-option
    PRINT
    VDU 134
  ENDPROC

  .big-message
  REPEAT
    VDU 131,141
    PRINT M$
  TIMES 2
  ENDPROC

  .wait-ESC
    VDU 26
    VDU 31,39,23
    VDU 131,157,132
    PRINT "Press ESCAPE to continue";
    REPEAT
    UNTIL GET=27
  ENDPROC

  .exit
    *FX 229,0
    *FX 138,0,27
    *WORD.
  ENDPROC

  .get-file-name
    CLOSE #0
    PROCflash
    VDU 7
    VDU 13
    PRINT "Please enter file name ";
    F$=""
    REPEAT
      R%=GET
      IF R%<> 13 AND R%<>27 THEN F$=F$+CHR
$(R%)
      PRINT CHR$(R%);
    UNTIL R%=13 OR R%=27
      PRINT
    IF R%=27 THEN F$=""
  ENDPR
  .load-text
    PROCget-file-name
    IF F$="" THEN ENDPROC
    F%=OPENIN(F$)
    IF F%<>0 THEN GOTO load-file
    PRINT
    PRINT "File not found";
    VDU 7
    PROCwait-ESC
    ENDPROC

  .load-file
    CLOSE #F%
    SELECT TEXT
    LOAD TEXT F$
  ENDPROC

  .save-text
    PROCget-file-name
    IF F$="" THEN ENDPROC
    F%=OPENIN(F$)
    IF F%=0 THEN GOTO save-file
    CLOSE #F%
    PRINT
    PRINT "Overwrite old file ? Y/N";
    VDU 7
    PROCyes-no
    IF A$="N" THEN ENDPROC
  .save-file
    SELECT TEXT
    SAVE TEXT F$
  ENDPROC

  .flash
    C%=3+2*R%
    VDU 31,0,C%
    VDU 131,157,132,136
    VDU 31,20,20
  ENDPROC

  .setup-window
    VDU 23;11,0;0;0;0
    CLS
    VDU 28,1,14,34,10
  ENDPROC

  .word-check
    PROCflash
    VDU 7
    IF SOT=FALSE THEN PROCcarry-on-check
    PROCsetup-window
    M$="          Please Wait"
    PROCbig-message
    M$="     Running Word Checker"
    PROCbig-message
    P$=""
    REPEAT
      W$=""
      REPEAT
        C$=GCT$
      UNTIL C$<"{" AND C$>"@" OR EOT
      REPEAT
        W$=W$+C$
        C$=GCT$
      UNTIL C$<"A" OR C$>"z" OR C$=R$
      IF W$=P$ THEN PROCsame-word
      P$=W$
    UNTIL EOT
    CLS
    VDU 7
    VDU 23;11,0;0;0;0
    VDU 28,1,14,34,10
    M$="      Word Check Complete"
    PROCbig-message
    PROCwait-ESC
  ENDPROC

  .spelling-search
    N$="Search has found - "
    PROCflash
    VDU 7
    VDU 13
    PRINT "Select spelling from list Y/N ?
";
    PROCyes-no
    IF A$="N" THEN GOTO spell-user
    REM Cursor off
    VDU 23;11,0;0;0;0
    CLS
    VDU 31,0,24
    VDU 131,157,132
    PRINT "Cursor up/down moves pointer"
    VDU 131,157,132
    PRINT "RETURN chooses spelling";
    VDU 30
    SELECT SEGMENT L%
    CURSOR TOP
    N%=0
    REPEAT
```

Continued ►

◀ **Check It Out, listing 1 continued**

```
    PRINT " "+GLT$
    N%=N%+1
  UNTIL EOT
  IF N%<=23 THEN GOTO spell-list-start
  CLS
  VDU 7
  VDU 31,0,14
  VDU 136
  PRINT "Can't execute - more than 23 it
ems"
  PROCwait-ESC
  ENDPROC

.spell-list-start
  N%=N%-1
  CURSOR TOP
  VDU 30
  PRINT CHR$(93)
  *FX 4,1
  Y%=0
  REPEAT
    A%=GET
    IF A%=139 THEN PROCselect-up
    IF A%=138 THEN PROCselect-down
  UNTIL A%=13
  W$=GLT$
  CLS
  VDU 31,0,21
  GOTO spell-search-start

.spell-user
  VDU 13
  PRINT "Spelling to be searched for ?
 ";
  W$=GLK$

.spell-search-start
  SELECT TEXT
  IF W$="" THEN GOTO spell-search-end
  IF SOT=FALSE THEN PROCcarry-on-check
  PROCsetup-window
  M$="          Please Wait"
  PROCbig-message
  M$="   Running Spelling Search"
  PROCbig-message

.spell-check
  FIND W$
  IF EOT THEN GOTO spell-search-end
  PROCpossible-error
  CURSOR RIGHT
  GOTO spell-check

.spell-search-end
  SELECT TEXT
  PROCsetup-window
  VDU 7
  M$="    Spelling Search Complete"
  PROCbig-message
  PROCwait-ESC
ENDPROC

.error-check-1
  PROCflash
  VDU 7
  IF SOT=FALSE THEN PROCcarry-on-check
  PROCsetup-window
  M$="          Please Wait"
  PROCbig-message
  M$="Running Multi Character Check"
  PROCbig-message
  REPEAT
    REPEAT
      W$=GCT$
    UNTIL W$<"{" AND W$>"@" OR EOT
    IF EOT THEN GOTO error-check-1-end
    Y$=W$
    REPEAT
      W$=GCT$
      IF Y$<>W$ THEN M%=1
      IF Y$=W$ THEN PROCsame-character
      Y$=W$
    UNTIL W$<"A" OR W$>"z" OR W$=R$

.error-check-1-end
  UNTIL EOT
  CLS
  VDU 7
  PROCsetup-window
  M$="Multi Character Check Complete"
  PROCbig-message
  PROCwait-ESC
ENDPROC

.error-check-2
  N$="Lower case error ? - "
  PROCflash
  VDU 7
  IF SOT=FALSE THEN PROCcarry-on-check
  PROCsetup-window
  M$="          Please Wait"
  PROCbig-message
  M$="    Running Sentence Check"
  PROCbig-message
  REPEAT
    REPEAT
      W$=GCT$
    UNTIL W$="." OR W$="?" OR W$="!" OR
EOT
    REPEAT
      W$=GCT$
    UNTIL W$>="A" OR EOT
  IF W$>="a" AND W$<="z" AND EOT<>TRUE T
HEN PROCpossible-error
  UNTIL EOT
  CLS
  VDU 7
  PROCsetup-window
  M$="     Sentence Check Complete"
  PROCbig-message
  PROCwait-ESC
ENDPROC

.main-program
R$=CHR$(13)

.program-start
SELECT TEXT
VDU 26
CLS
*FX 229,1
M$="     Wordwise Plus Text Checker"
PROCbig-message
PRINT
PRINT "              (C) C.Robbins 1988"
PROCspace-option
PRINT "1) Save text"
PROCspace-option
PRINT "2) Load text to be checked"
PROCspace-option
PRINT "3) Word check"
PROCspace-option
PRINT "4) Spelling search"
PROCspace-option
PRINT "5) Multiple characters"
PROCspace-option
```

Continued ▶

◀ Check It Out, listing 1 continued

```
PRINT "6) Sentence check"
PROCspace-option
PRINT "ESC - return to Wordwise Plus"
PRINT
PRINT
PRINT "Please enter choice ";
REPEAT
  R%=GET
  IF R%>=48 THEN R%=R%-48
UNTIL R%>0 AND R%<7 OR R%=27
IF R%=27 THEN PROCexit
IF R%=6 THEN PROCerror-check-2
IF R%=5 THEN PROCerror-check-1
IF R%=4 THEN PROCspelling-search
IF R%=3 THEN PROCword-check
IF R%=2 THEN PROCload-text
IF R%=1 THEN PROCsave-text
GOTO program-start
```

See Get The Fax, page 72

Listing 1. Fax page designer

```
   10 REM FaxForm
   20 REM by Michael Geller
   30 REM B+/M/C/A
   40 REM (c) BAU July 1989
   50 :
   60 MODE 128
   70 VDU 23;8202;0;0;0;
   80 DIM page% &501
   90 page%=page%+1
  100 VDU 19,0,7;0;19,1,0;0;
  110 VDU 23,2,221,119,221,119,221,119,2
21,119
  120 *TV 0,1
  130 *FX 4,1
  140 *FX 12,3
  150 *FX 225,225
  160 VDU 23,224,0,0,0,0,126,255,255,126
  170 VDU 23,225,0,0,0,255,0,0,0,0
  180 VDU 23,226,24,24,24,24,24,24,24,24
  190 VDU 23,227,24,24,24,255,24,24,24,2
4
  200 VDU 23,228,0,0,0,153,0,0,0,0
  210 VDU 23,229,0,24,0,24,0,24,0,24
  220 VDU 23,230,0,24,0,153,0,24,0,24
  230 VDU 23,231,0,24,0,255,0,24,0,24
  240 VDU 23,232,24,24,24,153,24,24,24,2
4
  250 PROCdotable
  260 :
  270 REPEAT
  280 PROCclear
  290 quit%=FALSE
  300 PROCgetformat
  310 FOR I%=page% TO page%+&4FC STEP 4
  320 !I%=&20202020
  330 NEXT
  340 PROCclear
  350 IF horiz% THEN PROChpage
  360 IF vert% THEN PROCvpage
  370 IF quit% THEN GOTO 490
  380 REPEAT
  390 choice%=FNmenu
  400 IF choice%=1 THEN PROChorizline(22
5)
  410 IF choice%=2 THEN PROChorizline(22
8)
  420 IF choice%=3 THEN PROCvertline(226
)
  430 IF choice%=4 THEN PROCvertline(229
)
  440 IF choice%=5 THEN PROCtext
  450 IF choice%=6 THEN PROCload
  460 IF choice%=7 THEN PROCprint
  470 IF choice%=8 THEN PROCsave
  480 UNTIL choice%=9
  490 UNTIL quit%
  500 VDU 26,20,12
  510 END
  520 :
  530 DEF PROCgetformat
  540 LOCAL key$
  550 inv%=TRUE
  560 PROCoutline("F a x - f o r m",32.5
,5)
  570 PROCoutline("_______________",32.5
,5.5)
  580 inv%=FALSE
  590 PROCbox(30,15,50,10,1,0)
  600 PROCoutline("WHICH FORMAT ?",33,11
)
  610 COLOUR 1
  620 PRINT TAB(2,2)"H - Horizontal"
  630 PRINT TAB(2,3)"V - Vertical"
  640 PRINT TAB(2,4)"Q - Quit";
  650 REPEAT
  660 key$=GET$
  670 UNTIL INSTR("HhVvQq",key$)
  680 IF key$="h" OR key$="H" THEN PROCh
orizvars
  690 IF key$="v" OR key$="V" THEN PROCv
ertvars
  700 IF key$="q" OR key$="Q" THEN PROCq
uitvars
  710 IF NOT quit% THEN ?(page%-1)=ASCke
y$ AND &DF
  720 ENDPROC
  730 :
  740 DEF PROChorizvars
  750 horiz%=TRUE
  760 vert%=FALSE
  770 width%=72
  780 height%=16
  790 ENDPROC
  800 :
  810 DEF PROCvertvars
  820 vert%=TRUE
  830 horiz%=FALSE
  840 width%=36
  850 height%=32
  860 ENDPROC
  870 :
  880 DEF PROCquitvars
  890 horiz%=FALSE
  900 vert%=FALSE
  910 quit%=TRUE
  920 ENDPROC
  930 :
  940 DEF PROCbox(left,down,right,up,fco
l,bcol)
  950 VDU 24,left*16-4;(31-down)*32-16;(
right+1)*16-4;(32-up)*32;
  960 GCOL 0,129
  970 CLG
  980 VDU 24,left*16-2;(31-down)*32-12;(
right+1)*16-6;(32-up)*32-4;
  990 GCOL 0,128
```

Continued ▶

◀ Get The Fax, listing 1 continued

```
1000 CLG
1010 VDU 26
1020 COLOUR bcol+128
1030 COLOUR fcol EOR 1
1040 VDU 28,left+1,down,right-1,up+1,12
1050 ENDPROC
1060 :
1070 DEF PROCpchars
1080 LOCAL char%,data%,temp%
1090 DIM pchar$(9)
1100 RESTORE 1170
1110 FOR char%=1 TO 9
1120 FOR data%=1 TO 20
1130 READ temp%
1140 pchar$(char%)=pchar$(char%)+CHR$temp%
1150 NEXT
1160 NEXT
1170 DATA 1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0,1,0
1180 DATA 0,0,0,0,0,0,0,0,255,252,0,0,0,0,0,0,0,0,0,0
1190 DATA 1,0,1,0,1,0,1,0,255,252,1,0,1,0,1,0,1,0,1,0
1200 DATA 1,0,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,0,0,0
1210 DATA 0,0,0,0,0,0,0,0,146,72,0,0,0,0,0,0,0,0,0,0
1220 DATA 1,0,0,0,0,0,1,0,146,72,0,0,1,0,0,0,0,0,0,0
1230 DATA 1,0,1,0,1,0,1,0,146,72,1,0,1,0,1,0,1,0,1,0
1240 DATA 1,0,0,0,0,0,1,0,255,252,0,0,1,0,0,0,0,0,0,0
1250 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
1260 ENDPROC
1270 :
1280 DEF PROChpage
1290 VDU 24,0;0;1279;1023;
1300 VDU 28,3,17,76,0
1310 CLS
1320 GCOL 0,1
1330 MOVE 44,1279
1340 DRAW 44,444
1350 DRAW 1233,444
1360 DRAW 1233,1023
1370 MOVE 44,969
1380 PLOT 21,1233,969
1390 PRINT TAB(4,0);CHR$224;TAB(12,0);CHR$224
1400 PRINT TAB(20,0);CHR$224
1410 PRINT TAB(52,0);CHR$224;TAB(60,0);CHR$224
1420 PRINT TAB(68,0);CHR$224
1430 ENDPROC
1440 :
1450 DEF PROCvpage
1460 VDU 24,0;0;1279;1023;
1470 VDU 28,0,31,40,0
1480 CLS
1490 GCOL 0,1
1500 MOVE 656,0
1510 DRAW 656,1279
1520 MOVE 50,0
1530 DRAW 50,1023
1540 PRINT TAB(1,2);CHR$224;TAB(1,5);CHR$224
1550 PRINT TAB(1,8);CHR$224
1560 PRINT TAB(1,23);CHR$224;TAB(1,26);CHR$224
1570 PRINT TAB(1,29);CHR$224
1580 ENDPROC
1600 DEF PROCpwindow
1610 IF vert% THEN VDU28,4,31,40,0 ELSE VDU28,4,17,76,2
1620 ENDPROC
1640 DEF FNmenu
1650 LOCAL key%
1660 PROCbox(45,30,70,19,1,0)
1670 PROCoutline("MENU",56,20)
1680 COLOUR 1
1690 PRINT TAB(1,2);"1. Horizontal lines"
1700 PRINT TAB(1,3);"2. Dotted horiz. lines"
1710 PRINT TAB(1,4);"3. Vertical lines"
1720 PRINT TAB(1,5);"4. Dotted vert. lines"
1730 PRINT TAB(1,6);"5. Text"
1740 PRINT TAB(1,7);"6. Load page"
1750 PRINT TAB(1,8);"7. Print page"
1760 PRINT TAB(1,9);"8. Save page"
1770 PRINT TAB(1,10);"9. Quit";
1780 REPEAT key%=GET-48
1790 UNTIL key%>0 AND key%<10
1800 =key%
1820 DEF PROCoutline(text$,X,Y)
1830 LOCAL X%,Y%
1840 VDU 5
1850 GCOL 0,1+inv%
1860 GCOL 0,128-inv%
1870 X%=(X*16)
1880 Y%=1019-(Y*32)
1890 MOVE X%-2,Y%
1900 PRINT text$
1910 MOVE X%+2,Y%
1920 PRINT text$
1930 MOVE X%,Y%+4
1940 PRINT text$
1950 MOVE X%,Y%-4
1960 PRINT text$
1970 GCOL 0,0-inv%
1980 GCOL 0,129+inv%
1990 MOVE X%,Y%
2000 PRINT text$
2010 VDU 4
2020 ENDPROC
2040 DEF PROCmwindow
2050 VDU 28,46,30,69,20
2060 ENDPROC
2080 DEF PROCtext
2090 LOCAL key%,xpos%,ypos%,delete%
2100 PROCmwindow
2110 CLS
2120 PROCoutline("TEXT",56,20)
2130 PRINT TAB(1,2)"Use the cursor keys to"
2140 PRINT TAB(1,3)"move, TAB to end."
2150 PROCpwindow
2160 REPEAT
2170 IF delete% THEN PROCdelete
2180 PRINT TAB(xpos%,ypos%);
2190 key%=GET
2200 IF key%>31 AND key%<127 THEN PROCalphachar(key%)
2210 IF key%>224 AND key%<233 THEN PROCgraphchar(key%)
2220 IF key%=13 THEN xpos%=0:ypos%=ypos%+1
2230 IF key%=136 THEN xpos%=xpos%-1
2240 IF key%=137 THEN xpos%=xpos%+1
2250 IF key%=138 THEN ypos%=ypos%+1
2260 IF key%=139 THEN ypos%=ypos%-1
2270 IF xpos%=width% THEN xpos%=0:ypos%=ypos%+1
2280 IF ypos%=height% THEN ypos%=0
```

Continued ▶

◀ **Get The Fax, listing 1 continued**

```
 2290 IF key%=127 THEN xpos%=xpos%-1:del
ete%=TRUE
 2300 IF xpos%<0 THEN xpos%=width%-1:ypo
s%=ypos%-1
 2310 IF ypos%<0 THEN ypos%=height%-1
 2320 UNTIL key%=9
 2330 ENDPROC
 2340 :
 2350 DEF PROCdelete
 2360 PRINT TAB(xpos%,ypos%)" ";
 2370 PROCstore(xpos%,ypos%,32)
 2380 delete%=FALSE
 2390 ENDPROC
 2400 :
 2410 DEF PROCalphachar(key%)
 2420 VDU key%
 2430 PROCstore(xpos%,ypos%,key%)
 2440 xpos%=xpos%+1
 2450 ENDPROC
 2460 :
 2470 DEF PROCgraphchar(key%)
 2480 VDU key%
 2490 PROCstore(xpos%,ypos%,32)
 2500 PROCstore(xpos%,ypos%,key%)
 2510 xpos%=xpos%+1
 2520 ENDPROC
 2530 :
 2540 DEF PROCstore(x,y,char%)
 2550 LOCAL temp%
 2560 temp%=FNretrieve(x,y)
 2570 IF temp%>224 AND char%>224 THEN ch
ar%=lkp(char%-225,temp%-225)
 2580 ?(page%+x+y*width%)=char%
 2590 ENDPROC
 2600 :
 2610 DEF FNretrieve(x,y)=?(page%+x+y*wi
dth%)
 2620 :
 2630 DEF PROCdisplay
 2640 LOCAL P%,R%,temp$
 2650 PROCpwindow
 2660 P%=page%-1
 2670 FOR R%=0 TO height%-1
 2680 P%=P%+width%
 2690 temp$=CHR$?P%
 2700 ?P%=13
 2710 PRINT TAB(0,R%)$(P%-width%+1);temp
$;
 2720 ?P%=ASCtemp$
 2730 NEXT
 2740 ENDPROC
 2750 :
 2760 DEF PROCsave
 2770 LOCAL file$
 2780 CLS
 2790 PROCoutline("SAVE PAGE",53.5,20)
 2800 PRINT TAB(1,2)"Filename: (RETURN t
o"
 2810 INPUT TAB(1,3)"quit) "file$
 2820 IF file$="" THEN ENDPROC
 2830 OSCLI"*SAVE "+file$+" "+STR$~(page
%-1)+" "+STR$~(page%+&500)
 2840 ENDPROC
 2850 :
 2860 DEF PROCload
 2870 LOCAL file$,key$,ch%
 2880 CLS
 2890 PROCoutline("LOAD PAGE",53.5,20)
 2900 PRINT TAB(1,2)"Filename: (RETURN t
o"
 2910 INPUT TAB(1,3)"quit) "file$
 2920 IF file$="" THEN ENDPROC
 2930 ch%=OPENIN(file$)
 2940 CLOSE#ch%
 2950 IF ch%=0 THEN ENDPROC
 2960 OSCLI"*LOAD "+file$+" "+STR$~(page
%-1)
 2970 PROCclear
 2980 key$=CHR$?(page%-1)
 2990 IF key$="H" PROChorizvars
 3000 IF key$="V" PROCvertvars
 3010 IF vert% THEN PROCvpage
 3020 IF horiz% THEN PROChpage
 3030 PROCdisplay
 3040 ENDPROC
 3050 :
 3060 DEF PROChorizline(char%)
 3070 LOCAL key%,temp%,xpos%,ypos%,oxpos
%,X%
 3080 CLS
 3090 IF char%=225 THEN PROCoutline("HOR
IZONTAL LINES",49,20)
 3100 IF char%=228 THEN PROCoutline("DOT
TED HORIZ. LINES",48,20)
 3110 PRINT TAB(1,2)"Use cursor keys to"
 3120 PRINT TAB(1,3)"position first poin
t"
 3130 PRINT TAB(1,4)"(TAB to fix)."
 3140 PROCpwindow
 3150 REPEAT
 3160 temp%=FNretrieve(xpos%,ypos%)
 3170 PRINT TAB(xpos%,ypos%);CHR$(char%+
2);
 3180 key%=GET
 3190 PRINT TAB(xpos%,ypos%);CHR$temp%;
 3200 IF key%=136 THEN xpos%=xpos%-1
 3210 IF key%=137 THEN xpos%=xpos%+1
 3220 IF key%=138 THEN ypos%=ypos%+1
 3230 IF key%=139 THEN ypos%=ypos%-1
 3240 IF xpos%<0 THEN xpos%=width%-1
 3250 IF xpos%=width% THEN xpos%=0
 3260 IF ypos%<0 THEN ypos%=height%-1
 3270 IF ypos%=height% THEN ypos%=0
 3280 UNTIL key%=9
 3290 PRINT TAB(xpos%,ypos%);CHR$(char%+
2);
 3300 PROCstore(xpos%,ypos%,char%)
 3310 oxpos%=xpos%
 3320 PROCmwindow
 3330 PRINTTAB(10,3);"second point"
 3340 PROCpwindow
 3350 REPEAT
 3360 temp%=FNretrieve(xpos%,ypos%)
 3370 PRINT TAB(xpos%,ypos%);CHR$(char%+
2);
 3380 key%=GET
 3390 PRINT TAB(xpos%,ypos%);CHR$temp%;
 3400 IF key%=136 THEN xpos%=xpos%-1
 3410 IF key%=137 THEN xpos%=xpos%+1
 3420 IF xpos%<0 THEN xpos%=width%-1
 3430 IF xpos%=width% THEN xpos%=0
 3440 UNTIL key%=9
 3450 PRINT TAB(xpos%,ypos%);CHR$(char%+
2);
 3460 FOR X%=oxpos% TO xpos% STEP SGN(xp
os%-oxpos%)-(xpos%=oxpos%)
 3470 PROCstore(X%,ypos%,char%)
 3480 PRINTTAB(X%,ypos%);CHR$(FNretrieve
(X%,ypos%));
 3490 NEXT
 3500 ENDPROC
 3510 :
 3520 DEF PROCvertline(char%)
 3530 LOCAL key%,temp%,xpos%,ypos%,oypos
%,Y%
 3540 CLS
```

Continued ▶

◀ **Get The Fax, listing 1 continued**

```
3550 IF char%=226 PROCoutline("VERTICAL
LINES",50,20)
3560 IF char%=229 PROCoutline("DOTED VE
RT. LINES",48.5,20)
3570 PRINT TAB(1,3)"position first poin
t"
3580 PRINT TAB(1,4)"(TAB to fix)."
3590 PROCpwindow
3600 REPEAT
3610 temp%=FNretrieve(xpos%,ypos%)
3620 PRINT TAB(xpos%,ypos%);CHR$(char%+
1);
3630 key%=GET
3640 PRINT TAB(xpos%,ypos%);CHR$temp%;
3650 IF key%=136 THEN xpos%=xpos%-1
3660 IF key%=137 THEN xpos%=xpos%+1
3670 IF key%=138 THEN ypos%=ypos%+1
3680 IF key%=139 THEN ypos%=ypos%-1
3690 IF xpos%<0 THEN xpos%=width%-1
3700 IF xpos%=width% THEN xpos%=0
3710 IF ypos%<0 THEN ypos%=height%-1
3720 IF ypos%=height% THEN ypos%=0
3730 UNTIL key%=9
3740 PRINT TAB(xpos%,ypos%);CHR$(char%+
1);
3750 PROCstore(xpos%,ypos%,char%)
3760 oypos%=ypos%
3770 PROCmwindow
3780 PRINT TAB(10,3);"second point"
3790 PROCpwindow
3800 REPEAT
3810 temp%=FNretrieve(xpos%,ypos%)
3820 PRINT TAB(xpos%,ypos%);CHR$(char%+
1);
3830 key%=GET
3840 PRINT TAB(xpos%,ypos%);CHR$temp%;
3850 IF key%=138 THEN ypos%=ypos%+1
3860 IF key%=139 THEN ypos%=ypos%-1
3870 IF ypos%<0 THEN ypos%=height%-1
3880 IF ypos%=height% THEN ypos%=0
3890 UNTIL key%=9
3900 PRINT TAB(xpos%,ypos%);CHR$(char%+
1);
3910 FOR Y%=oypos% TO ypos% STEP SGN(yp
os%-oypos%)-(ypos%=oypos%)
3920 PROCstore(xpos%,Y%,char%)
3930 PRINT TAB(xpos%,Y%);CHR$(FNretriev
e(xpos%,Y%));
3940 NEXT
3950 ENDPROC
3960 :
3970 DEF PROCprint
3980 IF horiz% THEN gron$=CHR$27+"^"+CH
R$17+CHR$208+CHR$2 ELSE gron$=CHR$27+"^"
+CHR$17+CHR$104+CHR$1
3990 LOCAL C%,R%,P%,temp%,temp2%
4000 CLS
4010 PROCoutline("PRINT PAGE",53,20)
4020 PRINT TAB(1,2);"Please wait..."
4030 PROCpchars
4040 VDU 2
4050 VDU 1,27,1,77
4060 VDU 1,27,1,ASC"A",1,7
4070 VDU 1,27,1,ASC"U",1,1
4080 FOR R%=0 TO height%-1
4090 FOR C%=0 TO width%-1
4100 temp%=FNretrieve(C%,R%)
4110 IF temp%>31 AND temp%<127 THEN VDU
1,temp% ELSE VDU1,32
4120 NEXT
4130 VDU 1,27,1,ASC"A",1,0,1,13,1,27,1,
ASC"A",1,7
4140 VDU 1,27,1,ASC"<"
4150 PROCout(gron$)
4160 FOR C%=0 TO width%-1
4170 temp%=FNretrieve(C%,R%)
4180  IF temp%>224 AND temp%<233 THEN P
ROCout(pchar$(temp%-224)) ELSE PROCout(p
char$(9))
4190 NEXT
4200 VDU 1,13
4210 VDU 1,27,1,ASC"<"
4220 PROCout(gron$)
4230 IF R%=height%-1 THEN GOTO 4290
4240 FOR C%=0 TO width%-1
4250 temp%=FNretrieve(C%,R%)
4260 temp2%=FNretrieve(C%,R%+1)
4270 PROCout(FNjoiner(temp%,temp2%))
4280 NEXT
4290 VDU 1,13
4300 VDU 1,27,1,ASC"<"
4310 NEXT
4320 VDU 3
4330 ENDPROC
4340 :
4350 DEF PROCout(char$)
4360 LOCAL char%
4370 FOR char%=1 TO LEN(char$)
4380 VDU 1,ASC(MID$(char$,char%,1))
4390 NEXT
4400 ENDPROC
4410 :
4420 DEF FNjoiner(temp%,temp2%)
4430 LOCAL solid$,dotted$
4440 solid$=CHR$226+CHR$227+CHR$232
4450 dotted$=CHR$229+CHR$230+CHR$231
4460 IF INSTR(solid$,CHR$temp%)<>0 AND
INSTR(solid$,CHR$temp2%)<>0 THEN =pchar$
(2)
4470 IF INSTR(dotted$,CHR$temp%)<>0 AND
 INSTR(dotted$,CHR$temp2%)<>0 THEN =pcha
r$(5)
4480 =pchar$(9)
4490 :
4500 DEF PROCclear
4510 GCOL 16,128
4520 CLG
4530 ENDPROC
4540 :
4550 DEF PROCdotable
4560 RESTORE 4660
4570 LOCAL char%,temp%
4580 DIM lkp(7,7)
4590 FOR char%=225 TO 232
4600 FOR temp%=225 TO 232
4610 READ lkp(char%-225,temp%-225)
4620 NEXT
4630 NEXT
4640 ENDPROC
4650 :
4660 DATA 225,227,227,225,231,231,231,2
27
4670 DATA 227,226,227,232,226,232,227,2
32
4680 DATA 227,227,227,227,227,227,227,2
27
4690 DATA 228,232,232,228,230,230,230,2
32
4700 DATA 231,229,231,230,229,230,231,2
30
4710 DATA 230,230,230,230,230,230,230,2
30
4720 DATA 231,231,231,231,231,231,231,2
31
4730 DATA 232,232,232,232,232,232,232,2
32
```

ORDER FORM

5.25-INCH DISC SUBSCRIPTIONS

Yes! Please start my 5.25-inch disc subscription with the ________ issue.
See page 65 for details

01 UK	☐	£40.00
02 UK (with *BBC Acorn User* magazine)	☐	£55.00
03 EUROPE (Airmail)	☐	£76.00
03 OVERSEAS (Surface)	☐	£76.00
04 OVERSEAS (Airmail)	☐	£84.00

TOTAL VALUE £________

5.25-INCH MONTHLY DISCS

1988		1988		1989	
☐ JAN	0228-3	☐ JUL	0234-8	☐ JAN	0240-2
☐ FEB	0229-1	☐ AUG	0235-6	☐ FEB	0241-0
☐ MAR	0230-5	☐ SEPT	0236-4	☐ MAR	0242-9
☐ APR	0231-3	☐ OCT	0237-2	☐ APR	0243-7
☐ MAY	0232-1	☐ NOV	0238-0	☐ MAY	0244-5
☐ JUN	0233-X	☐ DEC	0239-9	☐ JUN	0245-3
				☐ JUL	0246-2

UK = £5.95
Europe = £6.95
Overseas = £7.95

TOTAL VALUE £________

3.5-INCH DISC SUBSCRIPTIONS

Yes! Please start my 3.5-inch disc subscription with the ________ issue.
See page 65 for details

01 UK	☐	£55.00
02 EUROPE (Airmail)	☐	£76.00
02 OVERSEAS (Surface)	☐	£76.00
03 OVERSEAS (Airmail)	☐	£84.00

TOTAL VALUE £________

3.5-INCH MONTHLY DISCS

1988		1989	
☐ AUGUST	0501-0	☐ JANUARY	0506-1
☐ SEPTEMBER	0502-9	☐ FEBRUARY	0507-X
☐ OCTOBER	0503-7	☐ MARCH	0508-8
☐ NOVEMBER	0504-5	☐ APRIL	0509-6
☐ DECEMBER	0505-3	☐ MAY	0510-X
		☐ JUNE	0511-8
		☐ JULY	0512-6

Monthly 3.5-inch discs are suitable for the Master Compact and the Archimedes.

UK = £6.95
Europe = £7.95
Overseas = £8.95

TOTAL VALUE £________

MAGAZINE SUBSCRIPTIONS

Yes! Please start my subscription with the ________________ issue.

	12 issues	27 issues
01 UK	£18.95	£35.00
02 UK WITH 5.25-inch DISC	£55.00	£110.00
03 EUROPE	£28.00	£50.00
04 MIDDLE EAST	£35.00	£60.00
05 THE AMERICAS AND AFRICA	£40.00	£70.00
06 REST OF THE WORLD	£45.00	£80.00

TOTAL VALUE £________

MAGAZINE BACK ISSUES

1987		1988		1989	
☐ JAN	0044-2	☐ JAN	0056-6	☐ FEB	0069-8
☐ MAR	0046-9	☐ JUN	0061-2	☐ MAR	0070-1
☐ APR	0047-7	☐ JUL	0062-0	☐ APR	0071-X
☐ MAY	0048-5	☐ AUG	0063-9	☐ MAY	0072-8
☐ JUN	0049-3	☐ SEPT	0064-7	☐ JUN	0073-6
☐ JUL	0050-7	☐ OCT	0065-5	☐ JUL	0074-4
☐ AUG	0051-5	☐ NOV	0066-3		
☐ SEP	0052-3	☐ DEC	0067-1		
☐ NOV	0054-X				
☐ DEC	0055-8				

UK = £1.95
Europe = £2.95
Overseas = £3.95

TOTAL VALUE £________

BINDERS

UK = £4.95
Europe = £7.95
Overseas = £14.95

TOTAL VALUE £________

☐ MAGAZINE BINDER 1201-7

24-HOUR TELEPHONE SERVICE (0672) 40825

ORDER FORM

ACORN USER SPECIAL DISCS AND ROMS

GRAPHICS UTILITIES DISC
40-track 0830-3 ☐
UK = £7.95
Europe = £8.95
Overseas = £9.95

EDUCATION DISC
40-track 0815-X ☐

VIEWCHART DISC
40-track 0920 ☐
UK = £12.95
Europe = £13.95
Overseas = £14.95

1987 COMPILATION DISC
80-track 0990-3 ☐
Double sided
UK = £6.95
Europe = £7.95
Overseas = £8.95

1988 COMPILATION DISC
80-track 0990-3 ☐
Double sided
UK = £7.95
Europe = £8.95
Overseas = £9.95

TOTAL VALUE £________

☐ USER DUMP 1001-4
☐ USER ROM 1002-2
☐ AXR ROM 1003-0
UK = £19.95
Europe = £20.95
Overseas = £21.95

TOTAL VALUE £________

SIDEWAYS RAM
UTILITIES DISC
40-track 0825-7 ☐
UK = £9.95
Europe = £10.95
Overseas = £11.95

CALLIGRAPHY
40/80-track 0950-4 ☐

PORTFOLIO DISC
80-track 0970-9 ☐

NETWORK UTILITIES
DISC
80-track 0809-5 ☐
UK = £19.95
Europe = £20.95
Overseas = £21.95

GAMES DISC ☐
80-track, double sided 0610-6
UK = £8.95
Europe = £9.95
Overseas = £10.95

☐ **I enclose a cheque/postal order for a total of ________ made payable to Redwood Publishing Ltd**

☐ **Please debit my** ☐ **Visa (Barclaycard)** ☐ **Access (Mastercard)**

Credit card number ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ **Expiry date** ☐☐☐☐

SIGNED ________ DATE ________

MR/MRS/MISS/MS ________ INITIALS ________ SURNAME ________

ADDRESS ________

____

POSTCODE ________ TELEPHONE ________

Return your order to: Redwood Publishing Ltd, *BBC Acorn User* Mail Order, Marlborough Rd, Aldbourne, Wilts SN8 2DD.

For Office Use Only

0 0 ☐☐ ☐ ☐☐☐☐☐☐ ☐

2 0 0 1 X   3 5 3   N   Y   D   P   ☐☐☐   ☐☐☐

B41 ☐☐☐☐☐☐☐

24-HOUR TELEPHONE SERVICE (0672) 40825

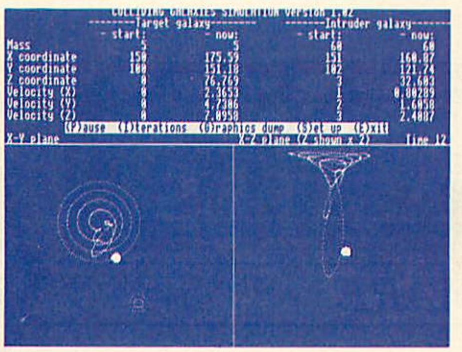
OFFERS

THIS MONTH'S LISTINGS

This month's cover feature lets you put on your Creator-of-the-Universe hat and see what happens when galaxies collide!

If your printer's standard NLQ fonts are dull and uninteresting, then have a look at Hints and Tips. Included this month are programs to convert and download new fonts. For the hackers among you, there is also a suite of programs to pass parameters to Basic programs.

For the Archimedes' owner, Agora features a handy number formatting routine and a couple of graphics demos, one to demonstrate the speed of the machine and the other to keep you amused.



If you have trouble with grammar and spelling then why not try out our *Wordwise Plus* utility!

Finally, how to organise your personal organiser and print out your own customised pages – how did you ever do without it?

Sky watching

GAMES DISC

Ten of the best *Acorn User* games on one 80-track double-sided 5.25-inch disc.

Whether you're into arcade or adventure type games this new disc has something for everyone. The games included are *Warlord, Wizalon, Castle of Nightmares, Run Silent, Run Deep, Polyominoes* and *Quadline*. We have also included three of the most popular one-line games from recent Abusers. Test your knowledge with *Mastermind* and start playing *Varpon* and *Lurch* to win.

Make sure you get your disc of fun and entertainment and send off for the Games disc today. At only £8.95 it will make the perfect gift.

Games galore for just £8.95



'88 COMPILATION DISC

BBC Acorn User is pleased to announce the arrival of the 1988 Compilation disc.

Whatever you use your micro for, you will find something on this disc for you. The 5.25in disc is available now. The 3.5in disc will be available next month.

Included on the 5.25in and the Compact and Electron disc is: *Wizalon* – our popular bouncing wizards game; *AutoROM*, a program that allows the storage of machine utilities in Sideways RAM; *Micro Sherlock*, the game of artificial intelligence for the BBC; Joe's introduction to spreadsheets and the graph plotter to help plot out the results; Bezier curves – fancy mathematical graphical curves; Microspacing and justifying for the improvement of your *View* printouts; *Polyominoes*, the fun block-fitting game; design your own adventures with *Imagen* plus much more. The disc also has the best from last year's Graphics Bonuses.



A detailed list of the contents of the 1988 Compilation disc for the Arc and A3000 will be announced next month.

Whichever version of the 1988 Compilation disc you choose you'll find it a bargain, the 5.25in disc is only £7.95, and the 3.5in discs are £8.95.

All the very best of '88 on one disc

ORDER BY TELEPHONE (0672) 40825

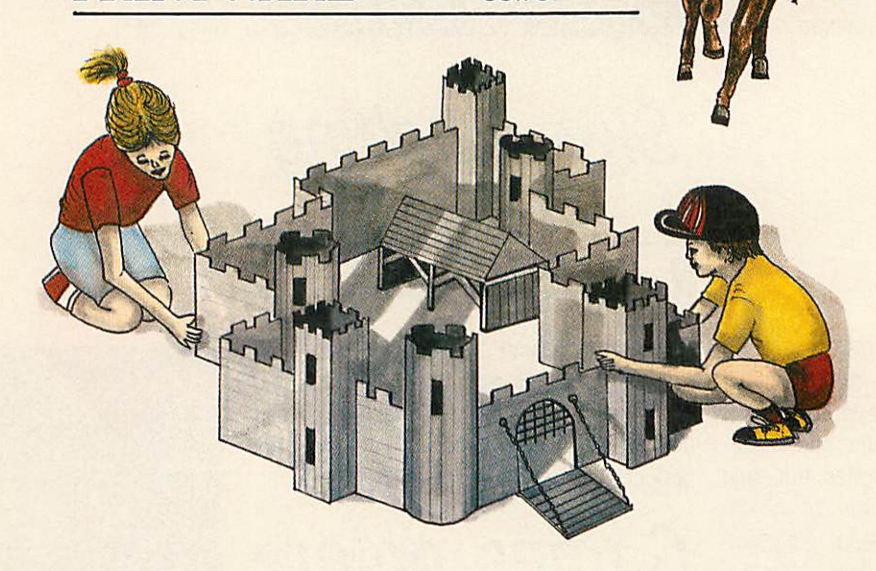
OFFERS

CUT OUT AND KEEP

DESIGNER CASTLES

PRINTWARE





Design it – build it

Every so often *BBC Acorn User* finds something a little bit special, something which opens new dimensions for your micro. *Designer Castles* from Data Design is one such discovery. We are delighted to offer our readers the opportunity to be among the first with this innovative software.

So, why is *Designer Castles* so special? Because you build what you design! Designing could not be easier. A mouse or cursor keys give you complete control over icons and pull-down menus.

You can assemble walls on-screen from the wide range of sections and towers offered. Edit them at will, then place them in your plan and move on to your next wall. Just continue erecting your walls and turrets and all the other possible components until your castle is complete.

You can make your designs as simple or as complicated as you please. Extra buildings and working models of siege weapons are included for added realism and entertainment.

When you are sure you're satisfied with your design, simply switch on your Epson-compatible printer then sit back and watch while it produces your plan – and every component necessary to construct your model. Now all that's left to do is to cut out the pieces then fold and glue everything together. The software even puts glue tabs in all the right places and provides strengtheners to ensure a sturdy and usable model. When you tire of your castle simply screw it up and design another – as many as you like.

The *Designer Castles* package contains a Printware support ROM, the *Designer Castles* system disc (two discs for 40-track users), comprehensive User Guide/Manual and a hardbacked full colour binder.

Designer Castles is supplied for the BBC B/B+, Master 128 and Master Compact. It requires an Epson compatible printer of quad density graphics. We feel that *Designer Castles* is the perfect addition to all our reader's software libraries. 'It is providing a design and discovery environment, the like of which has not been seen on a BBC micro . . .', *BBC Acorn User, March '89.*

Please send me the following copies of *Designer Castles*

______ 40-track disc format at £36.34

______ 80-track disc format at £36.34

______ 3.5-inch disc format at £39.79

I enclose my cheque/post order for £______ made payable to **Data Design**

OVERSEAS ORDERS PLEASE ADD £4 P&P

SIGNED ______

NAME ______

ADDRESS ______

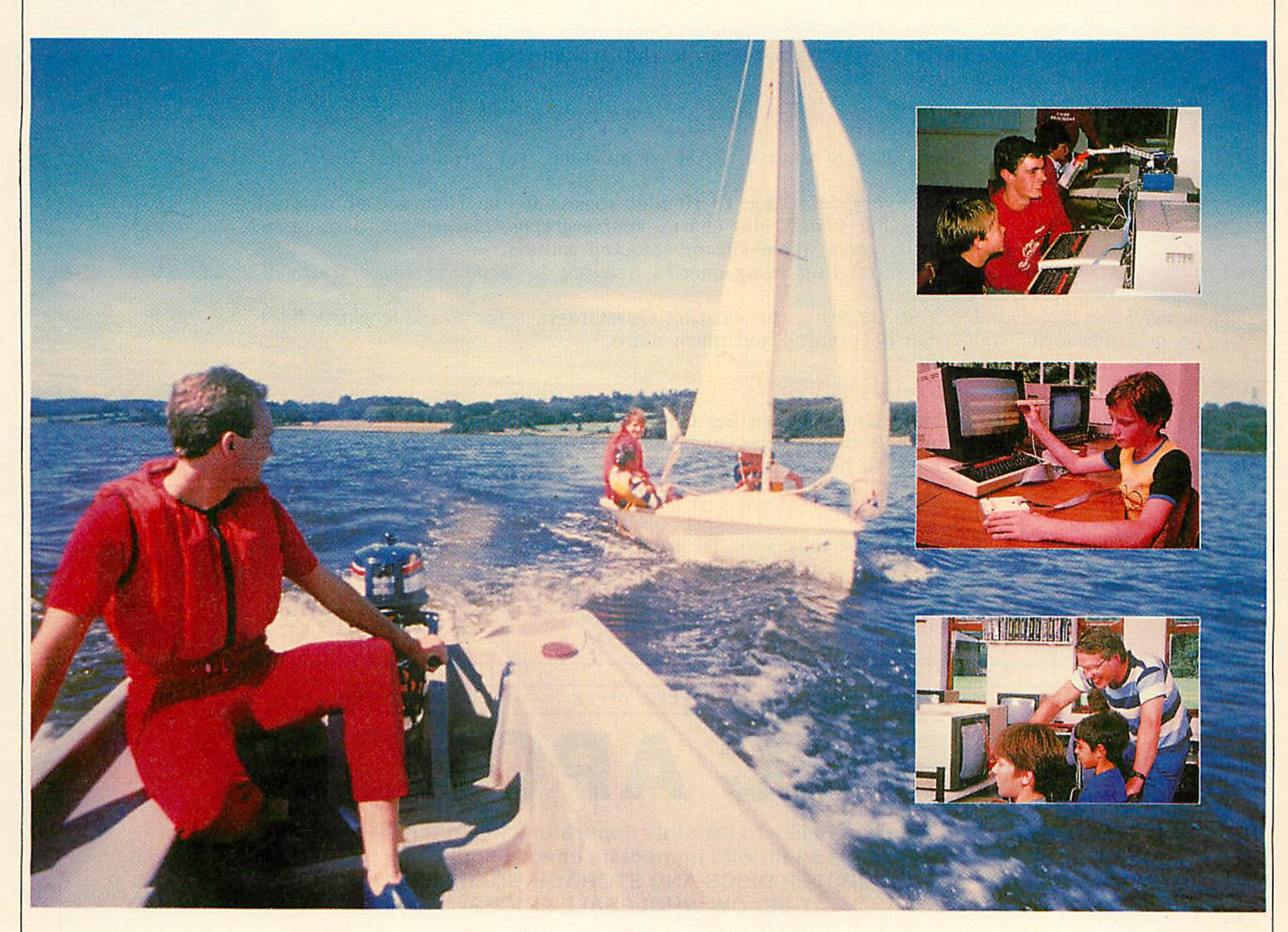
______

______ POSTCODE ______

Send this coupon with your remittance to **Designer Castles Offer, BBC Acorn User, Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ.**

OFFERS

CAMP BEAUMONT



Bring out the best in the children and save money

Do you dread the approach of the school holidays? When your life is turned upside down, inside out by your children. Do you worry how you are going to prevent them from becoming BORED.

Well all this can quickly change if you take advantage of this chance in a lifetime, save your sanity offer. *BBC Acorn User* is offering you the answer to all your problems – for just £189, a saving of £29 – **Camp Beaumont.**

What is Camp Beaumont you may be asking? It's the place to send your children if you want them to have a great time. The camp is at Kingswood, located just off the M54 on the Staffordshire/Shropshire border, and once here your children can learn all about computers. For the whole week they will be supervised by trained professionals who will teach them to use computers properly. Whether beginner or genius, Camp Beaumont can cater for all. The fun just starts with the computers, the camp also has swimming, biking, horse riding, go-karting and many more sporting and leisure activities to keep your children occupied but above all happy!

So if you want to help your children have a great holiday then don't miss this opportunity. The price of this week's visit to one of the leading activity camps also includes full supervision and three meals a day.

☐ Please send me a Camp Beaumont holiday brochure.

☐ Please send me a *BBC Acorn User* discount booking form.

NAME ______________________

ADDRESS ______________________

____

______________________ POSTCODE ______________

Send this to **Kay Lever, *BBC Acorn User* offer, Camp Beaumont, 9 West Street, Godmanchester, Cambridge PE18 8HG.**

ARCHIMEDES QUEST

A New Advanced Information Handling Package

WHAT IS ARCHIMEDES QUEST?

A fast and powerful new version of our very popular Quest data handling package. It has been substantially re-written to run in the Archimedes native 32-bit environment.

WHAT ADVANTAGES DOES ARCHIMEDES QUEST HAVE OVER OTHER VERSIONS

Very large datafiles - well over 3Mb of data in RAM on an A440, yet Archimedes Quest works equally well on an A305.
Very fast - 7 seconds to count every reference to Hamlet spoken in the first act of that play.
Graphics and statistics built in - bar charts, pie charts, scattergraphs, histograms, percentages and more in full colour. Created quickly and easily on a whole file or selected subsets.
Improved command language - search files using queries like *sex is "male"* or *name starts "Eli"* as well as all the commands from previous versions.
Numerous other improvements as suggested by existing Quest users - for example extra fields can be added, fields can be deleted, serial fields can be created and much more.

CAN I USE DATA FROM OTHER PACKAGES?

Archimedes Quest is fully compatible with existing Quest datafiles. It can import and export data in both CSV and TSV formats allowing interchange with packages such as *Pipedream* and *1st Word Plus*. It also supports the File Interchange Format allowing data to be transferred to and from other machines such as the RM Nimbus.

WHEN WILL ARCHIMEDES QUEST BE AVAILABLE?

Archimedes Quest is available now for only £30. To order Archimedes Quest or for details of any of our products contact:



Advisory Unit for Microtechnology in Education
Endymion Road, Hatfield, Herts AL10 8AU Tel: 07072 65443

SPECIAL OFFER — SPECIAL OFFER — SPECIAL OFFER — SPECIAL OFFER — SPECIAL OFFER

PUBLIC APOLOGY

We at M.D. Office Supplies would like to take this opportunity to apologise to all its competitors.
We shall, with immediate effect, supply
COMPUTER DISCS AND STORAGE BOXES ETC.,
AT BELOW WHOLESALE PRICES

JUST LOOK AT THESE AMAZING OFFERS

5¼ 5.25″ DISCS & BOXES 5¼

25 5.25″ DS DD 96 TPI with 50 Capacity Lockable Storage Box	£12.49
50 5.25″ DS DD 96 TPI with 100 Capacity Lockable Storage Box	£18.49
75 5.25″ DS DD 96 TPI with 100 Capacity Lockable Storage Box	£23.49
100 5.25″ DS DD 96 TPI with 100 Capacity Lockable Storage Box	£29.49
200 5.25″ DS DD 96 TPI with *two* 100 Capacity Boxes	£54.99

ALL DISCS ARE CERTIFIED 100% ERROR FREE
AND ARE SUPPLIED WITH FULL USER SETS
AT M.D. OFFICE THE BEST COST LESS

3½ 3.5″ DISCS & BOXES 3½

25 3.5″ DS DD 135 TPI with 40 Capacity Lockable Storage Box	£22.95
35 3.5″ DS DD 135 TPI with 80 Capacity Lockable Storage Box	£31.95
45 3.5″ DS DD 135 TPI with 80 Capacity Lockable Storage Box	£37.95
55 3.5″ DS DD 135 TPI with 80 Capacity Lockable Storage Box	£44.95
65 3.5″ DS DD 135 TPI with 80 Capacity Lockable Storage Box	£49.95
75 3.5″ DS DD 135 TPI with 80 Capacity Lockable Storage Box	£54.95

ALL DISCS ARE CERTIFIED 100% ERROR FREE
AND ARE SUPPLIED WITH LABELS

ACCESSORIES

3.5″ 40 Capacity Lockable Box	£4.95
3.5″ 80 Capacity Lockable Box	£6.95
5.25″ 50 Capacity Lockable Box	£5.95
5.25″ 100 Capacity Lockable Box	£8.95

3.5 or 5.25 Head Cleaner £2.95 only if ordered with other goods
Mouse Mats £2.95 only if ordered with other goods

BULK BUYERS

250 DS DD 5.25″	£64.99
500 DS DD 5.25″	£119.99
150 DS DD 3.5″	£110.00
250 DS DD 3.5″	£177.50
500 DS DD 3.5″	£316.99

PRICE AND QUALITY GUARANTEE

All our Discs are top quality products and are certified 100% error free. Should you ever see a comparable product advertised in this magazine at a lower price we will not match it we will
BEAT IT GUARANTEED



M.D. OFFICE SUPPLIES

18 CRESCENT WAY, FARNBOROUGH, KENT BR6 9LS
TELESALES HOTLINES: 0689 61400

All prices include VAT and Delivery UK only

Supplied subject to availability. E & OE

SPECIAL OFFER — SPECIAL OFFER — SPECIAL OFFER — SPECIAL OFFER — SPECIAL OFFER

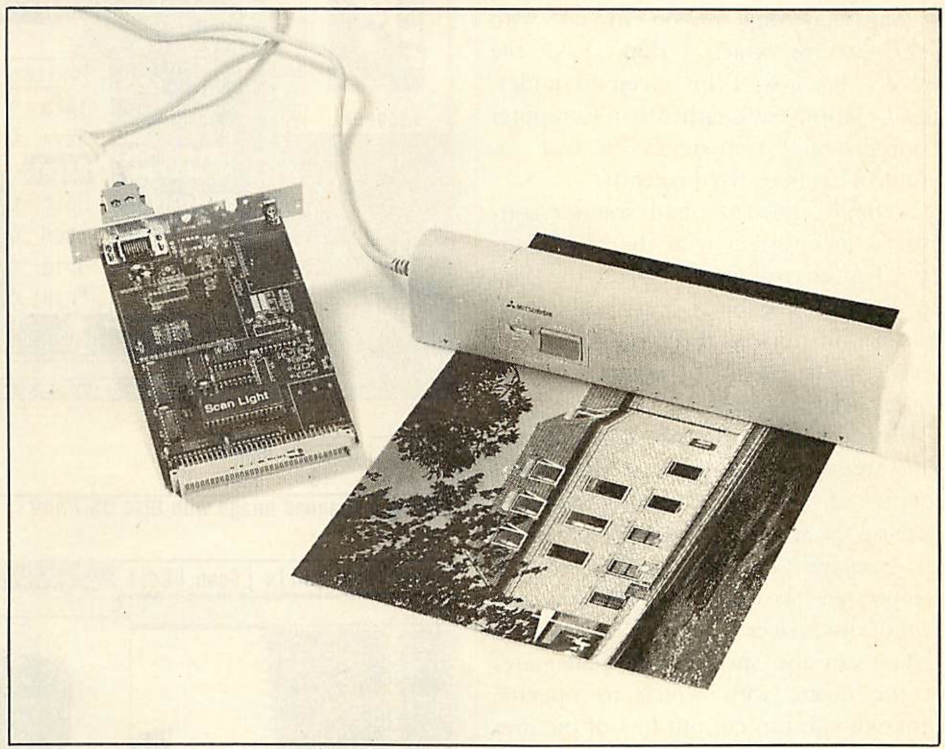
GETTING THE PICTURE

Dave Acton puts Computer Concept's new Scan-Light image scanner through its paces

In addition to the much-publicised (and yet to appear) Fax Card, Computer Concepts has now released the hand-held image scanner as a product in its own right. The package consists of the scanner itself, a podule expansion card that sits in the back of your Arc and a disc of sprite examples.

The software that drives the scanner is contained entirely on the podule card, which saves a lot of messing about.

It's difficult to see who the product is aimed at but as a means of getting pictures off paper and into your Arc, I imagine the market is potentially quite large. Desktop publishing and painting packages can all benefit greatly from the use of such a device. So how does this particular scanner stand up to scrutiny?



Scan-Light: seriously nice machinery

The hardware

The scanner is a pleasantly neat little box from Mitsubishi. It runs along on rollers, illuminating the page with a row of red LEDs underneath and has a button on the side to depress when scanning. All in all this is a seriously nice piece of machinery.

The movement of the rollers is noted so that if you scan at an uneven speed the software will know about it and compensate accordingly.

The only other control on the device is a contrast wheel to adjust the brightness of the image received – vitally important when it comes to scanning text.

The software

To be fair, I shall split the software into two parts – the low-level stuff that talks to the scanner and the 'front-end' software responsible for loading and saving, image manipulation, printing and so on.

At the low-level end I'm again glad to say that I can find little fault. The quality of the images produced (after a few minutes practice) is really much higher than I would have expected.

At the high-level end it's sadly a different story. I must admit I didn't expect much to start with. The software that goes with add-ons like this is rarely up to much. As you would expect, the current image is shown within a window as a mode 0 sprite. You can 'pan around' at leisure and, if required, another window can be opened showing a 16 grey-shade version of the scanned picture. In general, pictures are treated as 16-shade images and text as two-shade, although this is entirely up to you.

The picture-editing facilities included are very primitive to say the least. A pixel editor is just about all you're given and even this is of no real practical use. My advice has to be to invest in Risc OS and transfer your scanned images to the Risc OS *Paint* application.

This brings me on to a general point about add-ons like the scanner. I can appreciate that manufacturers face a dilemma when it comes to supplying software with their products. On the one hand there is no point in supplying much in the way of image-processing facilities when people are just going to export the pictures to their own favourite packages anyway. On the other, manufacturers can't assume the punters have anything in the way of painting software and so feel obliged to provide the minimum in the way of editing facilities.

The result, perhaps inevitably, is a limited and largely useless collection of tools as is supplied with Scan-Light.

Printing is another illustration of this point. I did try printing out an image on my Epson 24-pin but gave up when 'Address exception' errors started appearing. I might have been doing something wrong but it doesn't really matter anyway! Risc OS printing facilities produce excellent results on dot-matrix printers, so I just saved my images as sprites, went into the DeskTop, installed the dot-matrix printer driver and dragged

my sprite file onto the appropriate icon.

In describing this method I have also revealed that I didn't use Scan-Light from within the DeskTop. The reasons are two-fold.

First, problems have occurred with scanning from within the Risc OS DeskTop environment because, well, it's a long and dull reason to do with interrupts for which I don't have the space. This was, I am given to understand, Acorn's fault rather than Computer Concepts' and rumour has it that the problem has been fixed recently.

Secondly, the front-end scanner software is inconsistent with the rest of the DeskTop environment. Again, this is a bit disappointing but I don't really care! All that matters is that you can get a decent sprite out of the scanner and do with it what you like.

However, it's not fair to condemn the software outright without mentioning a couple of the more useful features. Because the scanner is from the complete Fax package you can save images in a compressed 'fax file' form. This can save a lot of disc space.

You can also specify a particular area of the image with which to operate, although you can cut out bits of pictures very easily using Risc OS *Paint* and this has to be a better approach. The manual, by the way (barring spelling mistakes) is very good.

Overall

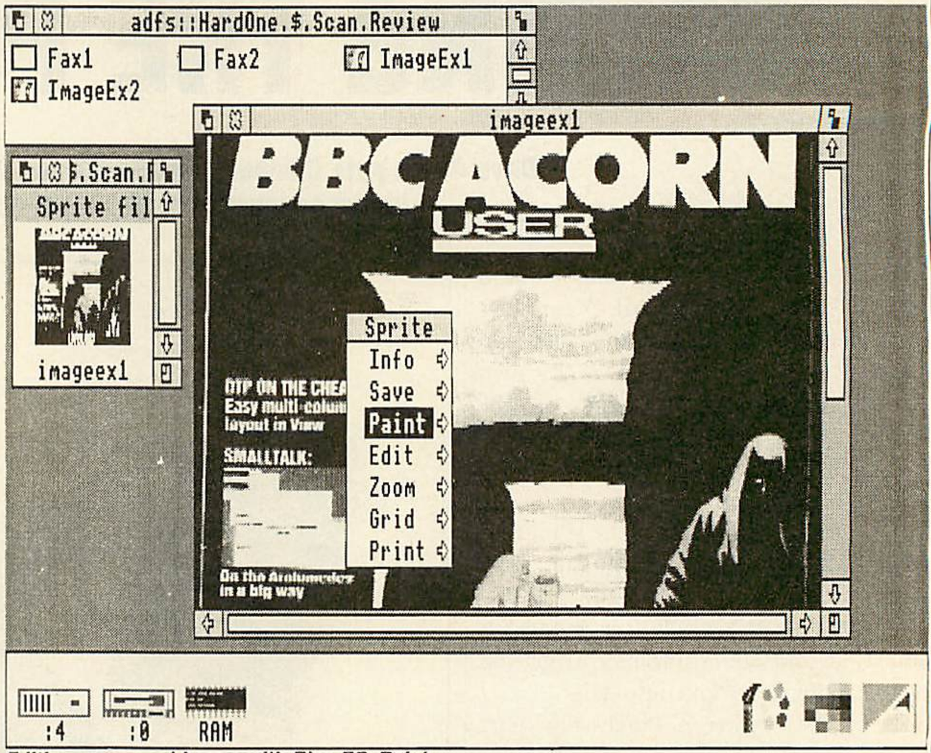
To summarize, Computer Concepts has produced a high-quality image-grabbing facility for the Archimedes made up of good hardware and fairly lousy but quite adequate software.

To complete the picture, consider the price tag of £516. This is, to say the least, a bit steep. I wouldn't rate the software as having any great value in itself, so I think this price has to be regarded as the cost of the hardware with the software thrown in free. Scanners alone can be bought for very much less and so, even with the cost of podule development taken into the sums, 'expensive' is a word which must be applied in conclusion. So, should you buy it?

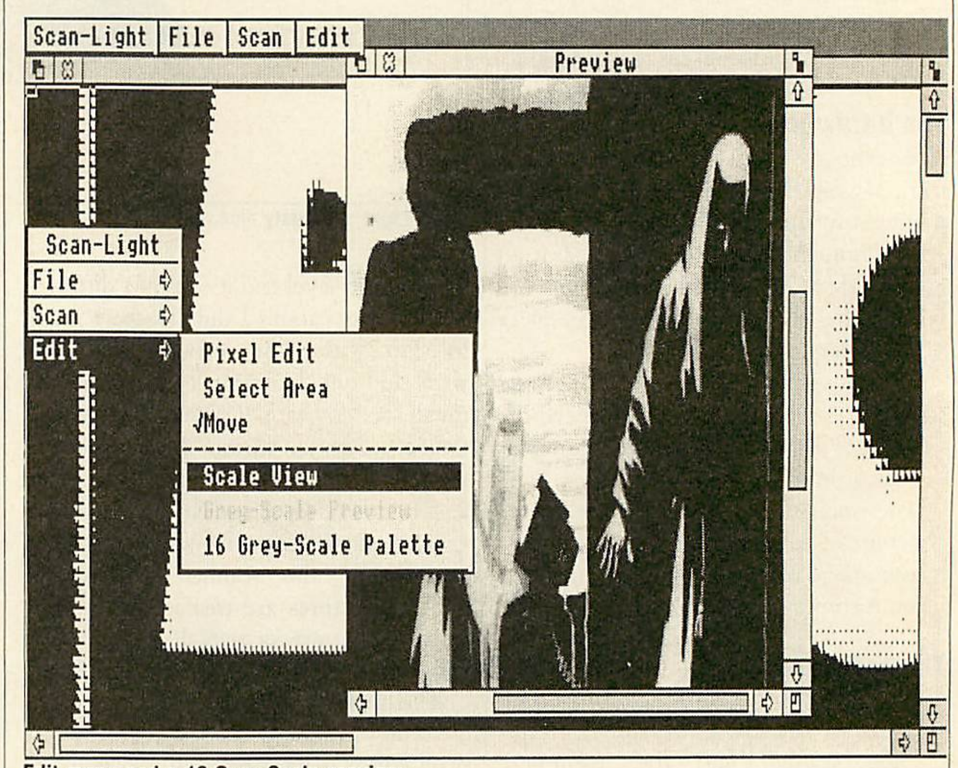
There is no doubt that pictures grabbed by Scan-Light are of surprisingly high-quality. It does its basic job very well indeed. In conjunction with Risc OS, it becomes a sensible addition to any Arc system – particularly in the area of DTP. But the cost may well be too high for many pockets.

If you are lucky enough to have the money and want a good way of grabbing pictures then you should certainly consider splashing out. If your purse-strings are more inelastic though, you should hang on to your cash.

Scan-Light £449 +VAT from Computer Concepts, Gaddesden Place, Hemel Hempstead HP2 6EX. Tel: (0442) 63933.



Editing a scanned image with Risc OS *Paint*



Edit menu and a 16 Grey-Scale preview

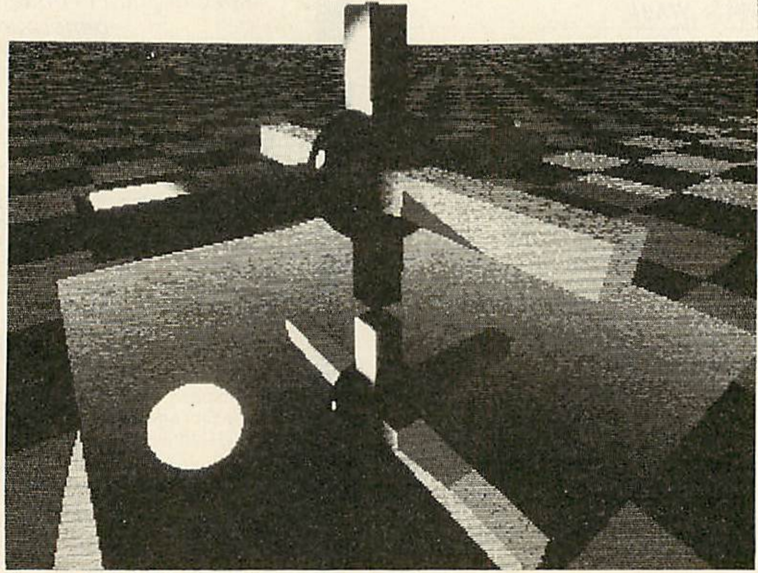
SOFTWARE

LIGHTEN UP

Richard Browning puts Render Bender, the ray tracing package from Clares, through its paces. He reckons it could be better

Only if you've recently landed from the planet Pluto, will you have missed Clares' expansive advertisements proclaiming the arrival of the first commercial ray-tracing program for the Arc, *Render Bender*.

Like the *ProArtisan* program, the menu system of *Render Bender* is Basic-based with the speed-essential parts written in machine code. *Render Bender* is a package of two programs, the first creating the ray-traced image and the second providing the animation.



You can build pictures with a choice of seven shapes

Two discs are supplied, one which contains the programs and the other some example scene command files and compressed screen images.

On booting the disc (no real advantage is taken of Risc OS) you are presented with an initially impressive entry screen of a spinning gold coin. After a short period, a selection screen appears from which you choose to go either to *Render Bender* ray-tracing or the *Delta Animator* animation section.

Both the initial and selection screens give good examples of what the package can achieve – unlike the packaging.

Ray tracing

Unlike packages like *Sculpt-4D* on the Amiga or *Euclid* on the Arc, *Render Bender* has no facility for placing objects on a wireframe map (with a plan view and projection view). Instead, the user positions objects using commands in a built-in line editor (which has a non-disruptive bug: keeping Insert pressed generates a substring error) accessed through the menu screen. Until a scene is described in the editor, the program will not allow tracing to occur.

Clares claims the editing approach is advantageous for those with little or no artistic talent but equally the opposite can be said if you do possess some flair. The non-interactive editing of the pseudo-language can be restricting.

The commands available to describe the scene allow the user to choose from seven objects (sphere, pyramid, box, disc, cone, tube, polygon) and each can have a number of specifiers which determine its colour and other characteristics (glass, shiny, mirror, opaque, metal, bulb). Specifying 'glass' makes the object transparent, 'shiny' gives it specular reflection, 'mirror' makes it reflective and 'opaque' gives it a murky appearance if necessary. 'Bulb' is useful as it makes the object white no matter what shade the rest of the environment is.

Unfortunately it is not possible to set the refractive index (which decides the angle at which light rays penetrate and move through an object) for individual objects. It is a global parameter set from the menu. In a similar fashion, the opacity of objects and also specularity are global operators.

These global parameters are severely restricting. For example, should you wish to create a hollow glass sphere (by defining a sphere of air (refractive index = 1) inside a larger sphere of glass with a different RI), you can't. The programmer, Dave Hoskins admits that he had tried this with no success and had given up! He gave the same reason of failure for the program's inability to ray-trace inside tubes and cones. If the right equations and algorithms are followed to the letter, as Clare's advertisement stresses they are, these problems should not be encountered.

There are two further things which have to be supplied in the command text before the scene can be traced: the position of our eyes (the observer) and the position of at least one light source. The light source can be of several different types – spotlight, point light or a parallel beam of light – with varying degrees of intensity.

You can choose to ray-trace your scene at different screen sizes, ranging from full screen down to 1/1024 size. Also, instead of tracing in high resolution (mode 15) tracing can take place in low resolution (mode 13) which speeds things up. Until you are sure the scene is exactly right, it's a good idea to trace the image in quarter size low res or sixteenth size high res. An option to draw a wireframe image would reduce development time considerably but this is not available.

From the menu, the focal lengh of the 'lens' through which the scene is viewed can be changed. The larger the value, the closer to the scene you get. It is also possible to bias the exposure of a scene if you have more than one light source by altering the 'lamp average'.

A scene can have one of many different floor types, ranging from wooden floorboards to circles, all scalable. The floor can also be a shiny or matt surface. The 'sky' can be any colour and the rate

of graduation from dark to light at the horizon can be altered.

Again, to speed things up, the user can toggle a parameter which determines whether shadows are generated or not.

Animation

In common with other ray tracing packages, *Render Bender* also lets you animate scenes developed not only in *Render Bender* itself but also from other sources. This is done in the other main program, *Delta Animator*.

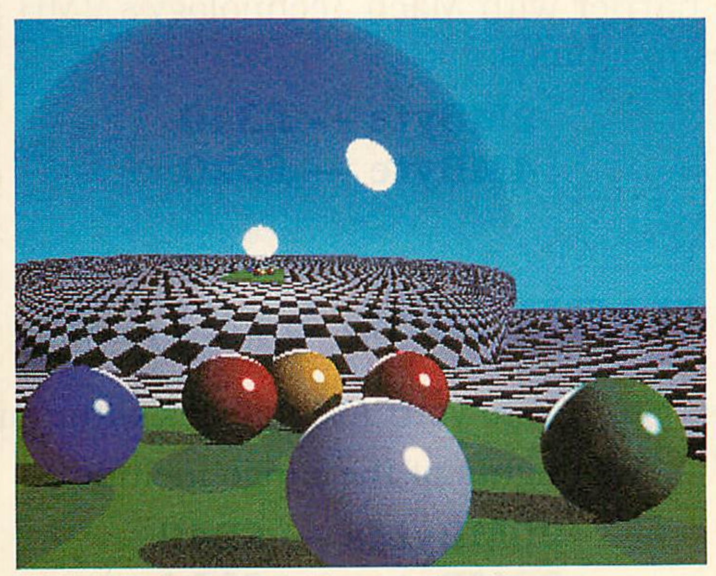
Before you move onto *Delta Animator*, you must first generate the screens necessary to provide the animation. This is done with the command file, specifying the total number of frames (screens) required. Twenty-six variables (VA to VZ) applied to the various parameters describing the objects in the scene, to alter the positioning and characteristics of those objects in successive frames. Mathematical operators can also be evaluated, for example (320*SIN(RAD (VA))). So you can produce a table performing mid-air loops! Your imagination and the memory available on your Arc are the only constraints.

When you are sure the objects will animate as required, it's time to begin ray-tracing. The user can display the scenes as they are generated and even specify at which frame to begin and end.

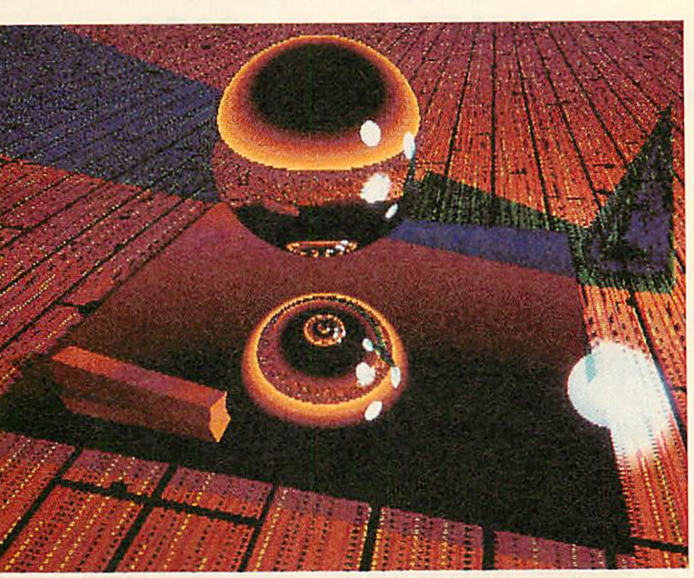
As each frame has to be traced individually the process can take a very, very long time! A supplied example animation, quarter screen size in high resolution, took about 12 hours to complete. It's a case of leaving the computer on overnight and waking up to find that you made a constant too large, the disc filled up after just one 25-minute frame, or the computer crashed because of a power surge.

Unless you meticulously plan your command text and predict its operation accurately, it can take an unlucky person quite a lot of trying and hair-tearing before everything fits together!

Anyway, your frames are hopefully complete. Clicking on 'Animate' in the *Render Bender* menu brings you into *Delta Animator* – for my money one of the better points of the package. After specifying to *Delta Animator* which set of frames you want animated (*Render Bender* saves each frame with the name you give and automatically generates a frame number suffix), it starts to load them in. To save memory, *Delta Animator* loads the first frame in full and then, for each successive frame thereafter, stores only the differences from the frame which preceeded it. Clever stuff. Once this process has finished you can save the compressed animation (and delete all the other frames, bar the first, to save disc space). Then, clicking on 'See Animation' allows you to do just that and pressing the left or right mouse button speeds or slows down the rate of motion.



Delta Animator helps you animate your ray traced images



Render Bender lets you express your imagination, but it's expensive

If you want to give your friends copies of your finished screens, you can't use Clares' screen compression module as it is its copyright. You can, however, save the screens in Screensave format by clicking on a toggle in the *Render Bender* menu. Your animations are subject to the same restrictions, although the actual animation code can be distributed.

Conclusion

Apart from *Delta Animator* and the manual (which is clear, concise, has an index and is spiral-bound) the package gives the impression that Clares has tried to do the minimum necessary to demand the £80 price. There also seems to be a lack of consistency within Clares as to what the aims of the package are.

For example, as said earlier, a wireframe quick-draw image of the scene is vital because of the time it would save. When asked about its absence, Dave Clare pleaded memory constraints, but Dave Hoskins said he hadn't thought of it! When I asked why it wasn't possible to ray-trace hollow spheres again Dave Clare stated lack of memory but the programmer said he just couldn't program ray-tracing of that complexity. Why can't you specify the characteristics of objects individually, like their refractive index? It's either 'Not enough memory' or 'I didn't think of it'.

Nevertheless, what the program does do, it does well.

Ray tracing is fast (though that's really thanks to the Arc itself), although the tracing itself is done in machine code, with specially written floating point routines. The latter does mean that Arcs with floating point co-processors are left out in the cold for the one thing they would have been a real boon for.

If you want ray tracing now, then go for *Render Bender*. Imagination has plenty of room to express itself through the package. If you can wait, my advice is to hang on to your eighty quid and see what else comes along.

Render Bender, *£80 from Clares Micro Supplies, 98 Middlewich Road, Rudheath, Northwich, Cheshire CW9 7DA.*

SOFTWARE

POWER OF THE PRESS

Has BBC desktop publishing come of age? Bruce Smith investigates the rival claims of *Wapping Editor* and *Pixel Perfect*

During the early part of 1986 two software packages were creating a small storm in the Beeb world – Mirrorsoft's *Fleet Street Editor* and *PageMaker* from AMX. Both products offered the BBC user their first steps into the world of desktop publishing.

The hype surrounding the two products was quite unbelievable with modest terms such as 'revolutionary', 'phenomenal', 'outstanding' and 'professional standard' being bandied about everywhere without shame.

The reviews in *BAU* quite rightly found a number of shortcomings in the products, not least that it took a number of days for even an experienced publisher to put together anything approaching a reasonable publication.

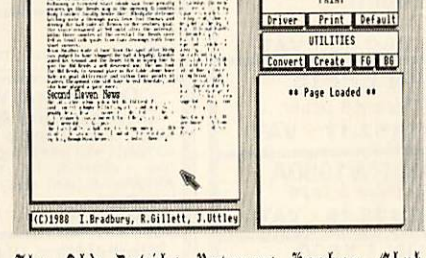
Even in its third incarnation on the PC *Fleet Street Editor* remains a poor product. Likewise so does *PageMaker* – now known as *Stop Press* – and this is the better of the two products.

Three years on there are two more DTP products available for the Beeb, which is in itself a testimony to the staying power of the computer. They are *Wapping Editor* from Watford Electronics, (the company now has the rights on *Stop Press,* interestingly enough) and *Pixel Perfect* from AVP.

Both products will run on BBC models B, B+ and Master and the table provides a useful comparison and summary of the two. *Pixel Perfect* is also available for the Electron and Compact and there is a version available for the Archimedes which is not covered here.

Wapping Editor

Watford's offering is supplied in the form of a 64K PAL Rom, a 40-track DFS format support disc (convertible to 80-track) and a useful, although sometimes illogically arranged, 100-page manual – the first four pages of which are errata. A three-button mouse is essential as the product cannot be driven from the keyboard. This is not a criticism. To my



Wapping Editor: sample doesn't do it justice

mind a mouse is an essential part of any graphics software.

Wapping Editor has a modular format. The front screen doubles up as a page preview environment and the control panel contains a number of menus from which the various software components can be launched. The first of these menus is the wordprocessor which is best described as a menu/mouse driven version of the original *Wordwise* but with a distinct feel of *View*!

The wordprocessor does not offer the facilities one normally associates with such software – it is more of an up-market text editor into which you can tap in text. It does provide two markers so that sections of text can be cut and copied as required. But it is rather slow in response and if you have either *View* or *Wordwise* installed, you're better off using those. That said, it works and does the job.

Creating a page

Before any creative work can be done, a page must be created on-disc and this is done from another of the front page menus. A number of page sizes are available, with A4 the most useful, being the listing paper standard. Once the page template is created on disc it occupies about 32K.

Page layout is performed from the graphics module and for best results all the page component files (text, graphics and so on) should be on the page disc. From here the typeface (font) can be selected along with the corresponding text file. The file is then flowed into the frame which you define at this point by positioning two cross-hairs on the screen page which is displayed with useful rules along each of the two axes. If there is too much text for the frame, it stays active and a new frame can be appended to the current one and the text will overflow into it. Once in position the text is surprisingly crisp and clear in all fonts.

The rest of the page is laid out in this fashion. Once on the page, the text becomes a 'graphic' and can only be manipulated as a 'single' object.

The main graphic menu contains all the normal graphic paraphernalia – lines, circles, ellipses and the like. Included among these is the pattern menu which provides eight shades of grey complemented by eight base patterns, any combination of which can be used.

The graphics menu itself occupies about one fifth of the screen but it may be turned on and off as required, which takes a little getting used to. It also provides access to other sub-menus such as the typesetting facilities.

A graphic cut and paste option is also provided at this point. A defined area

EPROMS, 8271 ETC.

	Exc VAT	Inc VAT
1-9 27128 250nS 21V	5.00	5.75
10+ 27128 250nS 21V	4.40	5.06
1-9 2764 250nS	2.77	3.19
1-9 27256 250nS	4.80	5.52
10+ 8271 Controller	34.00	39.10
1-9 8271 controller	38.26	44.00
1-9 6264 LP 150nS	6.00	6.90
Acorn 8271 DFS	45.22	52.00
Acorn 1770 DFS	45.22	52.00
Turbo Upgrade	98.78	113.50
Peartree MR-8000	47.83	55.00
RISC OS Upgrade	29.00	33.35

ROMS/SOFTWARE

	Exc VAT	Inc VAT
Inter-Word	35.65	41.00
Inter-Base	46.96	54.00
Wordwise Plus	37.39	43.00
MEGA 3	71.30	82.00
Spell Master	40.00	46.00
Artisans	30.43	35.00
Canes Tool Kit	30.43	35.00
View Store	35.65	41.00
Overview I & II	68.70	79.00

Phone for BBC/Archimedes software catalogue. 100's of titles inc Edu.

MONITORS

	Exc VAT	Inc VAT
Philips CM8802	173.04	199.00
Philips CM8852	251.30	289.00
Philips BM7502 Green	65.22	75.00
Philips 7522 Amber	73.91	85.00
Philips BM Stand	7.78	8.95
Philips TV Tuner	56.52	65.00
Taxan KX1201 (Green/p 39)	68.69	79.00
Taxan KX Amber	82.61	95.00
Microvitec 1451	221.74	255.00

(Prices inc. BBC Cable)

MASTER/ARCH

	Exc VAT	Inc VAT
Master 128K Micro	404.35	465.00
Archimedes 305 from	695.65	800.00
Master Compacts from	330.43	380.00
Master cartridges from	8.65	9.95
View 3 View Sheet guides	9.00	9.00
Reference Manuals	14.00	14.00
Master & BBC Dust Covers	3.00	3.45
BBC B's from	152.17	175.00

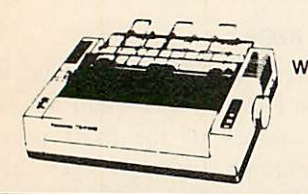
Large Discounts on systems
Educational Micro prices — phone

PHILIPS CM8833
with BBC cable
£225.00 (£195.65 + VAT)

VOLTMACE JOYSTICKS

	Exc VAT	Inc VAT
Delta 14B single	12.61	14.50
Delta 3B single	11.26	12.95
Delta 3B twin	17.35	19.95

PANASONIC KXP 1081



with BBC cable & paper
£155.00 (£134.78 + VAT)
with Screen Dump, 2m cable & paper
£160 (£139.13 + VAT)

	Exc VAT	Inc VAT
KXP Fabric Ink ribbon	3.74	4.30
KXP View Printer driver	7.83	9.00
KXP Control Dump rom	13.00	14.95

PANASONIC KXP 1180
with BBC cable & paper
£179.00 (£155.65 + VAT)

PANASONIC KXP 1124 (24pin)
with BBC cable & paper
£299.00 (£260.00 + VAT)

CITIZEN 180E
with BBC cable & paper
£149.00 (£129.57 + VAT)

TAXAN KP815
with BBC cable & paper
£175.00 (£152.17 + VAT)

CITIZEN 120D
with BBC cable & paper
£135.00 (£117.39+VAT)

CANON PW1080A
with BBC cable & paper
£159.00 (£138.26 + VAT)

STAR LC10
with BBC cable & paper
£189.00 (£164.35 + VAT)

EPSON LX800
with BBC cable & paper
£189.00 (£164.35 + VAT)

STAR LC10 COLOUR
with BBC cable & paper
£239.00 (£207.83 + VAT)

EPSON LQ500
with BBC cable & paper
£315.00 (£273.91 + VAT)

STAR LC2410
with BBC cable & paper
£315.00 (£273.91 + VAT)

PRINTERS/CABLES/ETC.

	Exc VAT	Inc VAT
Canon A55 (17" w)	260.00	299.00
Epson LQ850	465.22	535.00
Juki 2200 Daisy Wheel	233.91	269.00
Juki 6200 Daisy Wheel	286.09	329.00
Star NX15 (15" w)	294.78	339.00
1.5m (4 foot) BBC Cable	4.00	4.60
2.0m (6 foot)	6.00	6.90
Compact printer cable	6.00	6.90
IBM Archimedes cable	6.00	6.90
LX/LQ Sheet Feeder	62.61	72.00
LC10/LC2410	51.31	59.00
2 way printer switch	18.00	20.70
Printer Dust Covers	4.00	4.60

PRINTER RIBBONS

	Exc VAT	Inc VAT
LX800 & FX800 Print Ribbon	2.30	2.65
LX-80 Print Ribbon	2.13	2.45
NL-10 Print Ribbon	4.80	5.52
LC-10 Print Ribbon	4.00	4.60
1200 Print Ribbon	4.00	4.60
Taxan/Canon Print Ribbon	3.22	3.70
Juki 6100 Print Ribbon	1.30	1.50

Phone for quantity discounts

DISKETTES 100% error free
(lifetime warranty)

	Exc VAT	Inc VAT
10 Banana Reversible disks	6.85	9.95
10 3.5 D/S 135tpi	7.39	8.50
50 3.5" D/S 135tpi	34.80	40.00
100 3.5" D/S 135tpi	67.83	78.00
10 96tpi D S D D in box	5.17	5.96
50 96tpi D S D D in boxes	17.17	19.75
100 96tpi D S D D in boxes	32.09	36.90
50 Disc Box 3.5" – lock	5.17	5.95
50 Disc Box 5.25" – lock	5.65	6.50
100 Disc Box 5.25" – lock	6.52	7.50

5¼ DISC DRIVES

	Exc VAT	Inc VAT
Cumana CSX100 40T	74.78	86.00
Cumana CSX400 40/80T	89.57	103.00
Cumana CDX800S 40/80T	175.65	202.00
Cumana CD800S 40/80T	195.65	225.00
MD400A 400k No PSU 40/80T	78.26	90.00
MD400B 400k & PSU 40/80T	88.70	102.00
MD802C 800k No PSU 40/80T	156.52	180.00
MD802E 800k & PSU 40/80T	169.57	195.00
MD802D 800k – Stand 40/80T	190.43	219.00

FREE £8.00 DFS book with drives

Phone for our best price before placing your order
EDUCATIONAL & GOVERNMENT ORDERS WELCOME
All products have a 12 month no quibble guarantee
Prices subject to variation without prior notification
We are closed Saturday afternoons
Carriage 92p (80p + VAT) Securicor £6.90 (£6.00 + VAT)



Acorn Dept.
128 West Street,
Portchester,
Hants.
PO16 9XE.
Tel: 0705 325354

MENTOR - The Professional MASTER 128 compatible system

Mentor computer systems are 100% Master 128 compatible and are used in industry, commerce, education, research and the home. Housed in a 'PC' style case with internal drives and separate keyboard, they can be networked and have all the standard i/o ports available at the rear of the computer, and internally will accept all co-processors, 512 board etc, + all third party add-ons. All systems are covered by our 12 month warranty.

Model 2801 one 40/80 track drive	*£535.00 P&P £15.00*
Model 2802 two 40/80 track drives	*£625.00 P&P £15.00*
Model 2820SC one 40/80 track drive plus 20Mb winchester	*£934.00 P&P £15.00*

Mono Monitor add £73 Colour Monitor add £289 Other sized winchester systems available

Oak Disc Drives for the BBC Computer

Oak disc drive systems contain Mitsubishi D/S drives, single/double density, 40/80 track switchable. Drives are housed in metal cases, colour matched to the BBC and include cables, utility disc, on-line manual and 12 month warranty. *P&P £8.00 (single drive £6.00).*

400K Single 40/80t, D/S	*£85*	*800K Dual 40/80t, D/S, PSU*	*£215*
800K Dual 40/80t, D/S (rear sw)	*£165*	*800K 3.5"/5.25" Dual 40/80t, D/S*	*£185*
800K Dual 40/80t, D/S (front sw)	*£180*	*800K 3.5"/5.25" Dual 40/80t, D/S, PSU*	*£220*

SPARES

BBC	*Keyboard*	*£25.00 P&P £3.50*
	Plastic Case	*£12.00 P&P £3.00*
	Plastic Key Strip	*£2.00 P&P £1.00*
	Speaker Assembly	*£2.75 P&P £0.50*
	Keyboard Connector	*£1.00 P&P £0.50*
	Speaker Grille	*£1.00 P&P £0.50*
MASTER	*Keyboard*	*£56.00 P&P £3.50*
	Motherboard	*£246.00 P&P £3.50*
	Power Supply	*£51.00 P&P £3.50*
	Speaker Assembly	*£2.75 P&P £0.50*
	Battery Pack	*£2.75 P&P £0.50*
	Plastic Case	*£20.00 P&P £3.00*

Bits & Pieces

Uncased 5.25" 40/80t, DSDD drive	*£68.00 P&P £5*
Uncased 3.5" 1/3 height DSDD drive	*£68.00 P&P £5*
3.5" to 5.25" adaptor kit	*£18.00 P&P £3*
Oak Hard Disc host adaptor & software	*£55.00 P&P £8*
Single disc drive case	*£8.50 P&P £3*
Dual drive case (rear switch holes)	*£15.00 P&P £3*
Dual drive case (accepts PSU & fr sw)	*£19.95 P&P £3*
Hard disc case (accepts PSU & fan)	*£29.00 P&P £3*
Dual drive PSU (for above case)	*£35.00 P&P £4*
Winchester PSU (for above case)	*£45.00 P&P £4*

Archimedes Computers & Roland Plotters *£POA*

Computer Aided Design - Oak Professional Software

Oak Parametric Design Tool (PDT), the worlds first fully interactive Parametric CAD system, now greatly enhanced with extra features such as user defined functions, automatic movie generation and full definition enquiry facilities. PDT is used widely in Industry and Education, and allows the user not only to produce drawings, but to generate working models within the computer and to test and refine designs. PDT may also be used as a modelling aid in mathematics and physics. £359.00 P&P £ 6.00

Translator - interfaces with PDT and allows the user to import and export DXF and HPGL files, and to export IGES files. Files may be converted between any of the formats, and files of different formats may be merged, scaled and rotated. (Also useful for importing 'tricky' DXF files into Arc-Draw). *£149.00 P&P £6.00*

RIBACAD - DXF format parts library for architects, civil engineers etc. now available.

410 Upgrade Kits

20Mb (28mS access time) *POA* 47Mb (28mS access time) *POA* RAM upgrades *POA*

Oak Second Winchester Drives for the Archimedes

Metal cased external winchester drives complete with power supply, fan, all cabling and metalwork for the back of the Archimedes and easy to follow fitting instructions. *P&P £15.00*
20 Mb £349.00 *40 Mb £478.00*

Oak External Winchester Drive for R140 UNIX Machine

External full height winchester drive supplied as per Archimedes second winchester, plus wimp based utility program for formatting and partitioning of the winchester for ADFS and UNIX.
£725.00 *P&P £15.00*

Internal Hard Disc Upgrade Kits including Disc Controller Card

Suitable for the Archimedes and R140 computers, our new controller card supports up to seven devices (winnies, tape streamers etc.) and has a higher data transfer rate than Acorn's ST506 controller, particularly in high bandwidth screen modes. The card can support up to 4 winchesters of 512Mb each. A range of external winchesters for use with our card is available, sizes from 20 Mb to 380 Mb. Please enquire for prices and details.
(Prices include controller card) *P&P £15.00 on all items.*
20 Mb £375.00 *48 Mb £499.00* *80 Mb £625.00*

PCM20 - 20" Multisync Colour Monitor for Archimedes/R140

Ideal for CAD and DTP work, the PCM20 is designed to work in all screen modes except 23 and has seperate adjustments for each of 3 frequency bands. **Now also works with CGA, EGA and VGA PCs by means of simple back panel adjusment** *£1495.00 P&P £15.00*

Used Equipment

Please Ring for current stocks. *P&P £8.00*
Model B DFS from £249.00
Master 128 from £325.00

Laser Printing

Bureau service available (DTP, Arc-Draw etc.) Ring for prices.

Special Offer 20Mb Winchester for BBC/Master *only £299*

Complete with metal case, fan, PSU, all cables, utilities, user guide and 12 months warranty.
P&P £15
Other sized winchesters available - 20Mb to 94Mb. *POA*

Education and volume discounts available.
Local Government and Education Authority orders accepted.
Prices exclude VAT. UK customers please add 15% to total cost of goods and P&P.



OAK COMPUTERS
CROSS PARK HOUSE
LOW GREEN
RAWDON
LEEDS LS19 6HA.
Tel.(0532)502615
Fax. (0274)370543
Telex 51311 RELAYS G

(selected by employing a rubber-banding technique to outline it) is cut (deleted) and saved in a temporary file which may be either Ram-based (providing sufficient of the silicon stuff remains!) or disc-based. Pasting effectively reverses the process to copy the saved segment to the desired position, which is achieved by positioning the ensuing boxed outline of the item to be pasted.

An I/O menu allows mode 0 screens (this is the operational screen mode) to be loaded and the supporting utility disc includes a convert routine to magic other screen modes into mode 0. One other facility is the ability to interface to Watford's Beeb Video Digitiser so that camera pictures can be included – a useful touch.

At any one time the graphics screen shows about half of the A4 page. The other half can be shown by scrolling up and down the page using a mouse drag technique. Once the page is complete, it can be previewed in miniature at the start screen. The large sized typefaces are discernable but body text is too small to be displayed and therefore appears as a series of dots (the technical term for this is 'greeking'). Once again this compromise is generally acceptable.

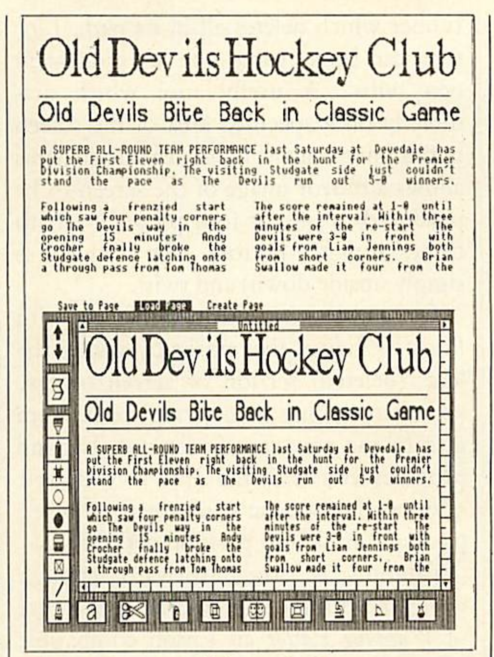
I have already touched on the subject of fonts. There are 13 styles available for use and these can be accessed either directly from the support disc or from a sideways Ram image which is supplied on the accompanying support disc. The advantage of the latter is that disc access is decreased though at the expense of a sideways Ram slot.

This might not sound too important at first glance but on a Master, for example, the software will use the Ram banks to store pages and thereby speed up the time it takes to access parts of a page quite drastically.

Printing from *Wapping Editor* takes place from the front screen and this can be performed in either draft or high quality mode. In either case an Epson compatible printer is assumed.

Pixel Perfect

This product is entirely disc-based and for the review I also had the Artpack which is essentially a disc of clip art which can be incorporated in the page. *Pixel Perfect* is supplied on two 80-track discs and a double-sided disc drive is needed. A 40-track version is also available. A slim, and rather inadequate 32-page manual completes the package.



Pixel Perfect: an all-in product

I was disappointed to find that the discs were protected and there were no instructions to indicate how backup copies could be produced.

Effectively you have to work with the masters. This also means that copying them onto a hard disc – which would have a drastic increase in operational speed – was not on.

Also very annoying is that you have to run it from drive 0, because if you try running it from drive 1 it looks for subsequent files on drive 0.

Whereas *Wapping Editor* takes a modular but integrated approach, *Pixel Perfect* is an 'all-in' product. Text and graphics which are created within the system are produced entirely insitu.

The screen display consists of a work surface with an icon-based menu bar down the left and across the base of the screen. Icons are selected by using the cursor keys and stepping through each in turn with the selected icon reversed out. Hitting the RETURN key at the appropriate point completes the selection. There is no option to use a mouse, which is a shame, as this is a more intuitive method of operation.

The actual process for creating a document is relatively straightforward and can be performed entirely on-screen if that is what you so wish.

Like *Wapping Editor*, the page must first be 'created'. This is done by selecting the 'create page' option from a main menu bar which straddles the top of the screen. A filename and destination drive completes the entry and the creation process starts.

This is a little tedious as the task takes two minutes to complete but since it only has to be done once per page it's livable with. It is not possible to select a page size. You are stuck with A4.

On completion the 'window' on-screen in edit mode is one-sixth of the overall page size but it is possible to preview in miniature the overall page (two if available) on-screen. However, this is accomplished via the master disc (which contains a number of utilities) after first saving and exiting *Pixel Perfect* – this is hardly satisfactory.

Only three fonts are supplied with the product though more are available in additional packs and user-definable fonts can be created. Fonts are selected at the onset before laying down any text.

The font is specified by entering a name (Roman, Gothic, or Sans Serif) and a cursor appears on screen which indicates where text will be displayed. This can be moved using the cursor keys and at this stage the height and width of the text can be set.

The manual indicates there are 625 possible combinations to choose from – more precisely there are 25 heights and 25 widths with each measurement being twice as large as the previous. An annoying feature of this process is that the text cursor can occasionally be left on the page and only subsequently removed by use of the 'rubber' to erase it.

Text can be entered directly on page and this is placed, justified, in a predefined frame. Copy is entered in an edit line displayed at the base of the screen which offers some rudimentary editing facilities. On completion it can be copied on to the page either horizontally or vertically.

More likely, and indeed more probably, you will want to create your text in a proper wordprocessor and like *Wapping Editor*, *Pixel Perfect* allows text files created in *View* or *Wordwise* to be imported. This text is dropped into a predefined frame and the text itself may

be justified, centred or ranged either left or right.

Unfortunately the software does not include any filters and so any commands, rules and what have you are also brought in with it. Another huge drawback is that you can only place text from a file on the current screen. You cannot move into one of the other segments as *Wapping Editor* allows. So, if you want to produce column text you can only do so by saving your text as very small files and then lacing one after the another – quite laborious, and frankly, not practical. As with *Wapping Editor* once text is in place, it is a graphic and you cannot edit it.

A second text menu caters for direct entry of headlines and deposits the text on the page much quicker and to a predefined size. If you don't specify a font, the standard BBC font will be used and this is best for body text.

The software's error trapping is rather poor and if an error occurs when you are trying to access one of the fonts, the font file remains open and cannot be used again unless you close and reload the document.

Graphic illustrations can be created insitu using a range of drawing tools, including pen, circles (filled and hollow), inverse areas, spray, boxes, arcs and a range of pattern fills. Bear in mind that all these tools are keyboard-driven and it is distinctly more difficult to produce quality drawings than it would have been using a mouse. That said, I have no doubt that some worthwhile results can be obtained with perseverance as all the tools are provided.

Graphics screens which have a *LOAD capability – which haven't been saved in any fancy format – can be imported. As the system works in mode 0 these come in best, however, a convert utility is present on the disc which does its best to knock them into shape for use.

Again, a curious approach is taken here. First you must position the cursor on the page at the point which will be the top left hand corner of the graphic. The file must then be saved and *Pixel Perfect* left and the master disc booted up. The main menu here provides the option to merge the graphic which can then be viewed by reloading *Pixel Perfect*.

Some further useful tools are also worth pointing out. For erasure there is a rubber which deletes all in its path. Line sizes can be set using one of 19 different pen 'nibs'. A useful tool which acts directly on a specified area of the screen is the mirror icon. Not surprisingly, this allows a mirror image of the screen to be produced in one of four planes – left to right, top to bottom, flip (which is simply upside down) and twist.

Cut and Paste is also possible. As with *Wapping Editor*, this works by saving the 'cut' (deleted) section of screen to disc and then pasting it (copying) back from disc to the new specified point. Expand provides you with the option to double one of the section's dimensions when pasting it back into position definitely.

Printing is straightforward enough using the printer icon and as in the case of *Wapping Editor* an Epson compatible printer is expected.

Conclusions

Both products are not exactly intuitive to use and if you are contemplating either one, you must expect to spend some time experimenting and generally playing with all the options before you can really get the best from either. This process is not helped by the non-hands-on approach of the manuals. The content of the *Pixel Perfect* manual is quite dreadful.

Feature	Wapping Editor	Pixel Perfect
Format	ROM	Disc
Support	Mouse	Keyboard
Multiple Page Sizes	•	–
WYSIWYG Display	•	•
Screen preview	•	•
Wordprocessing	•	–
Import text	•	•
Import *View/Wordwise*	•	•
Text continuation	•	–
Graphics facilities	•	•
Import graphics screens	•	•
Screen conversion	•	•
Digitiser interface	•	–
Multiple pages	–	–
Number of fonts	13	3
Font creation	–	•
Headers/Footers	–	–
Manual	•	•
Example File	•	–
Rating (out of 10)	8	4

Comparison of the two packages' features

As a seasoned DTP user, I found both products cumbersome to use but that is compared to very expensive software on more powerful machines. It should also be borne in mind that DTP is primarily a graphics-based process and in today's terms graphics is not one of the Beeb's strongest points as it requires vast amounts of memory.

Of the two, *Pixel Perfect* is the harder product to learn and rather ungainly in operation. In this area *Wapping Editor* is far superior, but at a cost. *Pixel Perfect* also has a number of irritating features. For instance there is no access to the star command prompt, there is no Quit option (other than CTRL-BREAK) and when you try to do something which is perfectly legitimate (like running from drive 1) childish messages are displayed, which assume you are trying to use the product illegally.

Both products offer a 'What You See Is What You Get' display which is essential for this type of product. The final printed output is what it's all about and in this respect there is little to choose between the two. Both dump what are clearly computer-generated pages and the fonts used on screen are far superior in looks than those printed.

Both products are limited to single page designs. Multiple pages are not allowed and functions such as headers and footers are non-existent though they can be produced manually on-screen.

Wapping Editor comes supplied with a sample page on disc for examination which is not very exciting and, in itself, does not do justice to the package. No disc-based sample pages are provided with *Pixel Perfect* though some are illustrated within the manual.

However, for the home, school or club both will do a good job. Bearing in mind the limitations of the Beeb for running this type of software, both achieve reasonable results. However, only the Watford product is really driving the Beeb to its full potential in this area.

Wapping Editor £79.35 (with Quest mouse £102.35) from Watford Electronics, 250 Lower High Street, Watford WD1 2AN. Tel: (0923) 37774. Pixel Perfect for B, B+, Master and Electron £45.43. For Compact £47.95. Fontpacks £14.38 (Compact £16.90). Artpack £22.43 (Compact £24.95) from AVP Computing, Chepstow, Gwent NP6 5ER. Tel: (0291) 625439.

DISCS
double sided, bulk price per 25

3½" 135 TPI £22
5¼" 48 TPI £8
96 TPI £9

MISC

3½" head cleaning kit £4
Parallel printer lead (Archimedes) £8
T-switch centronics £22

PRINTER RIBBONS
fabric, black price per 3

Epson

EX 800/1000 .... £12
FX 80/800 .... £12
FX 100/1000 .... £12
LX 80/86 .... £8
LX 500/800 .... £11
NEC P2200 .... £14
STAR LC10 .... £15
STAR NL10 .... £14

Many more in stock.
Please phone for details.

All prices include VAT, carriage free.

COMPUTER IMAGES
15 GROVE MARKET PLACE
ELTHAM, LONDON SE9 5PU
Telephone: 01-850 3883

BADGER MICROS (DEVON)
● Archimedes, BBC Master, Compact ●
● Disc Drives, Printers, Monitors, etc. ●

APPOINTED WATFORD DEALER
● Rom Boards, Ram cards, etc. ●

STOCKISTS OF COMPUTER CONCEPTS RANGE
● Interword, Spellmaster, Intersheet, etc. ●
● Discs, Disc boxes, Paper, Labels ●

Badgers Hill, Southerton,
Nr Newton Poppleford, Devon
Colaton Raleigh

(0395) 68516

PRINTER REPAIRS
specialists in

EPSON, STAR, SEIKOSHA, BROTHER

Sales/Service/Support/Spares

For Dealers and large organisations we can repair printers at a fixed rate. Please ring for further details.
Authorised repair centre for Seikosha printers

B.V. Computer Maintenance Ltd,
Park Royal Business Centre,
9/17 Park Royal Road,
London NW10 7LQ
Tel: 01-965 4056 **Fax: 01-961 7313**

EUROWORD
for WORDWISE and WORDWISE PLUS

Converts Wordwise to a European wordprocessor. Provides French, Italian, German, Scandinavian and Spanish characters grouped into five sets. For example:

French/Ital	German	Spanish
à ç é è ù ò ì	Ä Ö Ü ä ö ü ß	Pt ¡ Ñ ¿ ñ ç

Additional accented characters are easily produced by overprinting a UK character wth an accent as in ê. Euroword supports a range of printers including Epson type dot-matrix, Diablo 630 printwheels and the IBM extended character set.

"Wordwise-using modern language teachers should fall on Euroword gratefully" – Times Educational Supplement, 3 Feb 89.

Charm Micro Soft
10 Hall Lane,
Longton, Preston.
PR4 5XB. 0772-616705

Euroword is supplied on disc. A backup disc and 40 page manual are included. Price £14.90 inclusive. Please specify your printer and 40 or 80 track disc.

512 users,

Solve the compatibility problems of your MASTER 512 or BBC with co-pro adaptor using DOS+ Problem Solver

It corrects hardware incompatibilities (such as programmable interrupts' speed, low level keyboard scanning, etc.) and operating system's bugs, enabling the 512 board to run most IBM-PC programs that otherwise wouldn't run.

Lots of programs like Cat, Jet, Digger, ARTWORX's Strip Poker, ELECTRONIC ART's Golf, Driller, Dark Side, Impact, Charlie Chaplin, Test Drive, Infiltrator, StarQuake, Bushido, Tennis, all versions of MicroSoft's Flight Simulator, Frogger, Osbit, 688 Atack Sub, Defender of the Crown, Quadralian, Yes Chancellor, Anciant Art of War, Adventure Writter, Dream House, AFT, Droege, Dream, Delux Paint 2, Fontasy 2.08, News, PC Tutor, Lotus 123 2.0, Turbo Calc, Mandelbrot Generator, Prospero Pascal, Turbo Pascal 4.0, Turbo C 1.5, Turbo Prolog, Prolog2, PC File+, Galaxy, Trendtex/2, Homebase 2.15, Mindreader, DBASE III plus, Pipedream, etc. will run like in an ordinary IBM PC.

The program provides the INS, DEL, PG-UP, PG-DOWN, HOME, END and SC-LOCK keys to users who don't have the numeric keypad.
It will also allow you to switch between colour and B&W modes, change the computer's speed and save the hi-res picture on the screen, during the execution of any program.

DOS+ Problem Solver works with all 80186 co-processor boards (with 512K or 1M bytes RAM) using DOS+ 1.2-XIOS 1.00, DOS+ 1.2-XIOS 1.01 or DOS+ 2.1-XIOS 1.03.
If you need any further informations about DOS+ Problem Solver, please contact Shibumi Soft .

PRICE: £24.95 inc. program, user manual & one year free user suport.
Price includes VAT. Please add £3 for postage and packing. Faulty disks will be replaced.
Cheques should be payable to Shibumi Soft .

Shibumi Soft: R. Prof. Camara Sinval, 138
4100 PORTO
PORTUGAL



Have you spent long hours struggling with the programming complexities of the brilliant Archimedes **WIMPS** system?

YOU can easily and quickly build multi-window programs for Archimedes with pop-up menus, icons, mouse control, etc. of a professional quality. All in BBC Basic. With RISC OS your programs are multi-tasking and installed on the icon bar.

ARCHWAY provides a total environment for programming with **tools, run-time** code, program **shells**, extensive **examples** and a **library** of functions and procedures.

The **tools** let you define and edit windows, multi-level menus, icons, mouse pointers and much more. The cut, copy and paste, undo, on-line help and hard copy print-out facilities give you power as well as ease of use and convenience.

The **run-time** code becomes part of any program you create. It automatically handles windows, menus, icons, etc. for you. For example, opening a window can involve little more than calling a function with the window's name. Attach a menu name to a window using the tools and the menu functions without you writing a line of code. Give a menu item a command name and when a user chooses it a function in your code with the same name is called. You just write the contents of the function.

An in-depth user guide takes you gently step-by-step through a progressive series of program building examples. All examples are on disc ready to run.

£79.95
incl. VAT & p/p

The complete system comes on 4*800k discs (3 tools & 1 run-time) with a 300+ page, ring-bound user guide. You need 1M of RAM to run the tools. One disc drive is sufficient. No extra licence fee to distribute copies of the run-time in your programs.

AVAILABLE SOON: A Major New Release (VI. 1). Many new features; eg powerful graphics and text facilities for your programs by multitasking cooperation with the RISC OS Draw, Edit and Paint programs. **BUY ARCHWAY NOW AND UPGRADE WITHOUT FURTHER CHARGE!**



Programs to help you

4 CLARENCE DRIVE, EAST GRINSTEAD,
WEST SUSSEX RH19 4RZ **Telephone (0342) 328188**

Access

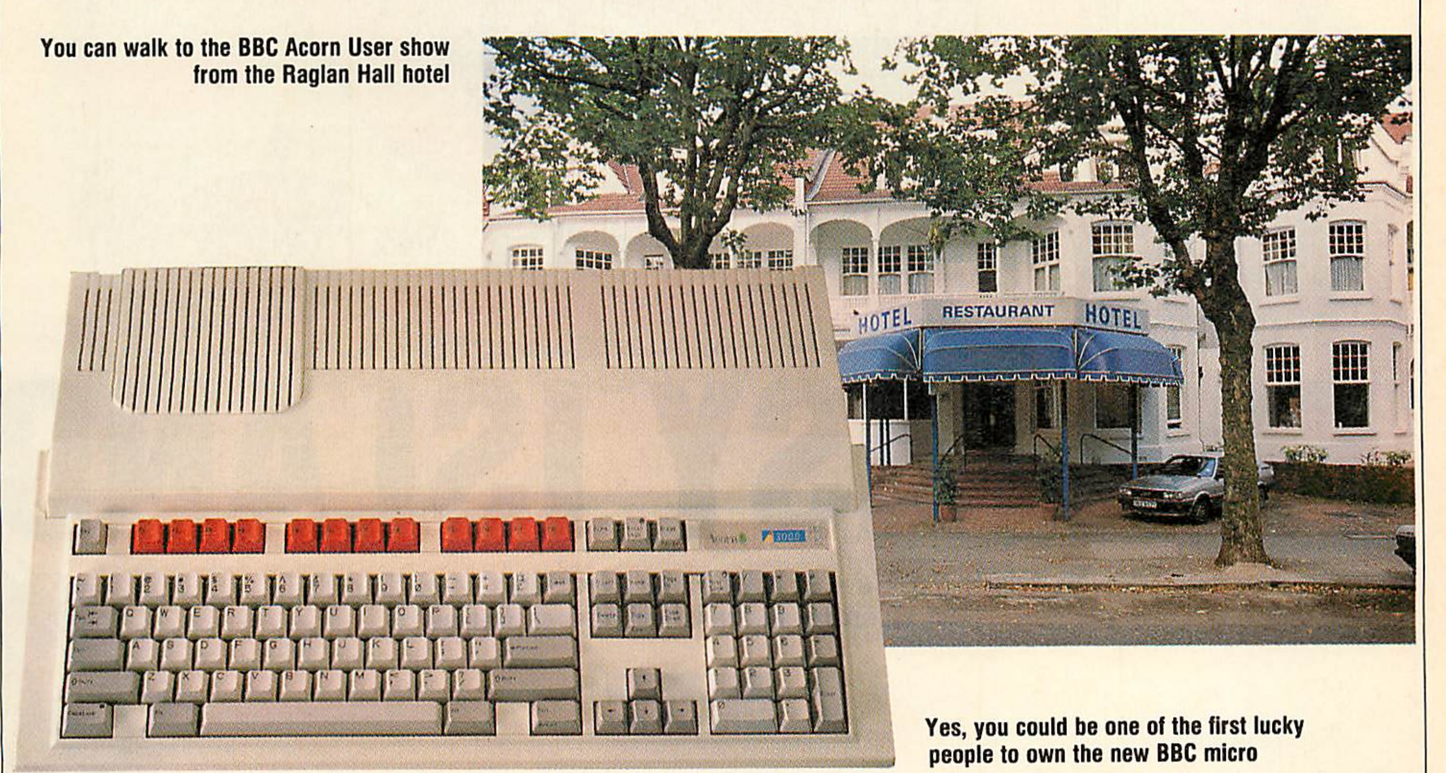
Cheques/POs/official orders or Access/Visa number and expiry date. 24-hour 'phone for Credit Card orders.



COMPETITION

WIN THE NEW BBC MICRO

Win a taste of luxury. This month's fantastic competition could also get you a night in a top London hotel



You can walk to the BBC Acorn User show from the Raglan Hall hotel

Yes, you could be one of the first lucky people to own the new BBC micro

Blow a few of the winter cobwebs away by entering this month's fantastic competition.

All you have to do is answer the six questions below correctly and the tie breaker. If your entry is with us by Monday 3rd July 1989 you could be one of the first people to own Acorn's new BBC micro.

The winner and a friend will also spend a night at the luxury Raglan Hall Hotel, Queens Avenue, Muswell Hill, London – just round the corner from Alexandra Palace. This trip will include all hotel expenses and free entry to the BBC Acorn User Show to pick up your prize from Acorn.

To help you get started with your new machine *BBC Acorn User* will give you a year's free subscription to our monthly discs and magazine.

Send your answers on a postcard, with your name and address, to: New machine competition, *BBC Acorn User*, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. The judges' decision will be final.

1) From where was the BBC's first broadcast made?
2) When was the first BBC micro launched?
3) What was Acorn's home computer prior to the models A and B?
4) How many model A and Bs were made? 650,000 800,000 or 500,000
5) When was the first issue of *Acorn User* published?
6) Who was the first editor of *Acorn User*?

Place the following features in order of importance:

a) A wealth of affordable software for every need
b) Good support by a local dealer network
c) The fastest home micro in existence
d) High quality graphics and stereo sound built in
e) Modern styling and reliable manufacturing
f) Lots of independent advice





FANTASY ISLAND

Ah, this is the life – or is it? Three adventures show that it's not all luxury on the island of your dreams

Dave Futcher



n children's literature there are numerous examples of stories centred around islands. Classics like *Treasure Island*, *Robinson Crusoe*, and *Swiss Family Robinson* develop the theme of desert islands but so do a wealth of other children's literature. It is a theme in the world of adults too. Look at the success of Roy Plumley's *Desert Island Discs* or even Shirley Conran's recent novel, *Castaways*.

It is little wonder that islands and adventures on them are a popular theme for educational computer simulations.

Probably the most well known island simulation is *Adventure Island* published by Ginn nearly five years ago. It is a 'classroom classic' and still available and worth buying. It can and is very often played by individuals but it was really designed for groups of children using their skills collaboratively.

The scenario is that the children have been stranded on a tropical island. They are required to make decisions and overcome difficulties and dangers in an attempt to survive the rigours of the fictitious island by exploring the various features in an attempt to ultimately escape or get rescued.

To start off the simulation, children write a short story describing the events that led to them being marooned on the island. Then with the program loaded for the first time they must choose five items of equipment to aid their survival from a limited list – first aid kit, nylon cord, knife, mirror, box of matches, magnifying glass, shovel, axe, five litre water container and magnetic compass.

Each group using the simulation then starts from a pre-determined position and they begin their exploration of the island using the separate large scale map as reference to their position given on the screen and their guide to the features of the island.

The challenge of survival is made more demanding by random occurrences of hazards which may affect weather and/or health conditions and may necessitate quick reorganisation of strategy.

Further interest is added by the map showing a number of unusual features and the tempting possibility of discovering long lost treasure.

Adventure Island is designed to be used as an extended activity made up of a series of sessions at the keyboard. Each one of which is meant to represent 'a day' on the island. An integral part of the project is keeping a daily diary of the group's experiences.

As well as this, the children also have to 'research' the various finds they make in their travels. For instance what are taro roots and are they any use to them? The children may also have to decide, if they have taken a first aid kit, which medicine they need to administer should one of the group suffer from ailments such as heat exhaustion.

As the scenario unravels, the children can document their adventure with a mixture of factual and creative writing plus some art and craft work.

As the children progress around the island a variety of problems have to be solved. For example they may need to

ILLUSTRATIONS BY MELVYN EVANS

decipher a mathematical sequence or a morse code message.

There are many dangers and dilemmas to be faced. There are swamps and minefields to be negotiated and events like an attack by a wild boar on groups at particular places.

When this does occur, usually one member of a group gets injured. As ever, at least one of the children in the group will be intent on travelling on to the cave where they had planned to shelter for the night whatever the cost. But with the injured person in no state to travel and the map being consulted and some realization that the planned over-night halt was up a steep incline, it all might seem an unnecessary risk.

The only answer is for them to seek shelter immediately so the injured person can recover by morning.

The diary entries for such days, are full of vivid description of the attack of the wild boars and a report of the decisions that led to the change of plans.

Using a simulation such as *Adventure Island* is not just about pressing buttons. It is about discussion, considering options and making decisions.

The bulk of the work when using this kind of simulation is done away from the computer. Learning is not derived from merely responding to the computer's display but is the interaction of the group, the research and the joy of discovering things around the island.

The latest package from Cambridgeshire Software is *Rescue: An Island Adventure*. This has been developed with a lot of input from Ian Whittington who was behind the original *Adventure Island*.

Rescue certainly shows how programming techniques have moved on from the basic text displays of *Adventure Island*. Here the whole simulation takes place in an animated microworld.

Unlike *Adventure Island* the scenario is set. You are going on holiday to visit your Uncle. The program first shows a large motor cruiser meandering around the island coastline and coming in to land at the quay.

Surprise, surprise there is no Uncle to meet the children! The graphics are an effective beginning and set the pattern for what is to come. Armed with a map of the island the group playing *Rescue* set off to find Uncle's cottage.

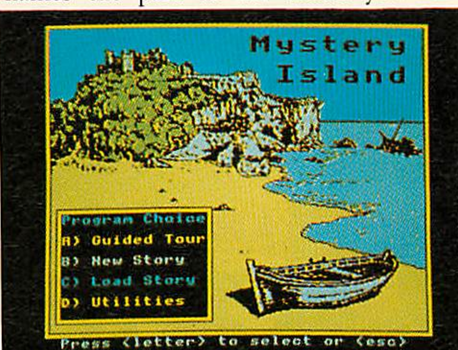
Gone are the simple text displays which still plague so many educational simulations and gone too are the numbers or letters to move around or to control the environment of the simulation.

Rescue replaces the 'normal' display children expect from educational packages with quality graphics and animation that in the past was only to be found in the province of the arcade game.

The main screen where the adventure takes place is made up of four parts. The major area taking up over a quarter of the screen. This is a window on the island and it is here that the children move around, explore and solve the problem of finding Uncle.

Above the window is a clear display of the co-ordinates of the square that is currently displayed so that movement can be traced on the printed map provided.

Below is a message box which names the part of the island you are visiting, and right at the bottom are a set of icons that tell the time and indicate how much food and water you have left.



Mystery Island – a creative writing program ...



... easy to use with other packages

Rather than dials to read, there is a bottle of water whose level drops when you are thirsty and baskets of food that disappear when used.

On the left of the island display is a display of the named four faces of the children playing. These change colour and facial expression as the simulation develops depending on things like morale and energy.

Moving around the island is achieved either with the computer's cursor keys or a Concept Keyboard. As the keys or pad areas are pressed a person-like sprite moves on the map. As the edge of the window is reached the display scrolls either left, right, upwards or downwards.

Children playing *Rescue: An Island Adventure* have real hands-on control in the way that keying numbers to move never had. More importantly, the display of the island with trees, bushes, pond and streams scrolling around it makes the scene pretty lifelike.

As well as Uncle's cottage the island has a number of other special features such as a mine, chapel, the lighthouse and a shipwreck. It is in one of these places that Uncle has gone missing!

As well as searching around the scrolling map, children can go inside the places they find. It is the details inside the places that make the game so outstanding. Children really feel it is them exploring.

For example, when they go inside the cottage they see a kitchen, bathroom, sitting room and library. There are objects to explore like a chest which contains dry clothes of all sizes and places to get more food and water.

One interesting facet of this simulation is that in a number of places the children discover they don't go around collecting objects. For example in Uncle's cottage, when they explore the library, they are told what maps, plans, books and objects are on the shelves.

By noting which maps or objects Uncle has taken with him, they can deduce where he might have gone.

The exploration of these places is very effective. Children literally walk inside and move around. The chapel is made to seem a pretty eerie place with its stone floor and tombstones. Of course there is a trapdoor (there has to be!) that leads to a maze and at the end is some treasure.

The object of the simulation is to locate Uncle and rescue him. Like all good educational packages, Cambridgeshire Software House allows plenty of teacher control, and fortunately it is an option for the teacher or a random decision to decide where Uncle has got lost. This can be in the chapel, the mine, at the West Cliff, or on the shipwreck.

Say, for example, the teacher has chosen the mine for the location of the lost Uncle. Eventually, the children will make their way to the mine and move around inside searching by going up and down ladders and following passages. Some children will want to map everything but it is not really necessary as there are a number of objects to help you remember where you have been. The tracks of the little underground railway provide a route to follow and the wagons along the way provide markers to the way back.

It is not entirely straightforward though. One path leads to a dead end with an appropriate skeleton (not Uncle!). In the end, Uncle can be seen in the distance and with a bit of back tracking the children searching get nearer. When he has been located in the mine, he shouts out 'I've fallen down the mine. Go to the lighthouse and get at least 20 metres of rope'. The group then goes off to the north west corner of the island in search of the lighthouse to get the necessary rope. After searching around the lighthouse they come across a chest with some lengths of rope but there isn't one long enough to rescue Uncle and the children have to select two suitable pieces that will make more than the length required when knotted together and carry it back to the mine.

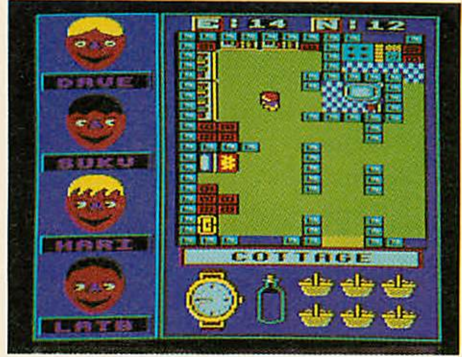
As a computer package for children *Rescue: An Island Adventure* is very well done indeed. It certainly uses the technical developments in programming sprite graphics and scrolling displays in a way that most educational software developers have not even considered.

Educationally it offers so much. For a start it gives children the chance to speculate and get involved in the reasoning processes used in real life situations.

Teachers or parents who see children use it at home or in the classroom will find it generates tremendous motivation and enthusiasm and provides many opportunities for children to work together to solve a common problem.

If you are looking for a theme that is ripe for cross curricular development, Islands is one well worth considering. With computer simulations like *Adventure Island* or *Rescue: An Island Adventure* available you and your children will have a unique opportunity. But as well as these two simulations there is another unique package.

It's called *Mystery Island* and it is the latest package from Tressel Publications, the educational software co-operative, which in the past has specialised in historical simulations. *Mystery Island* is a new departure for them. It is a creative writing program for 7-12 year olds that incorporates a picture editor, as well as a wordprocessor and spelling checker. It is a brilliant program to use in conjunction with other software such as *Adventure Island* or *Rescue: An Island Adventure* but it can equally be used alone, making pictures and writing stories.



Rescue: An Island Adventure . . .



. . . where children face adversity . . .



. . . in a quest to find their uncle

Stories can begin in any of eight Mystery Island scenes. These include a beach, a boat out at sea, a wreck, a boat coming in to land on the island, a cave, a castle and a wood. In addition there is one blank scene for your own designs.

One of these scenes has to be chosen for the children to begin their story.

Then by using the package's picture editor the children can add transfers to the scene, building up certain elements. These can be anywhere on the background and flipped to appear in different directions and the colours of faces and tee shirts can also be changed.

Altogether there are 50 transfers to choose from but no more than eight can be added to each scene. However, that is not a practical limitation.

The available transfers cover a good range. There are 10 boys and 10 girls in different positions such as running, jumping, walking and falling, a set of birds and animals, creatures like demons and ghosts and a range of objects including treasure chests, a barrel, a lamp and a map. The text editor offers useful wordprocessing facilities. Up to 30 lines of 40 characters each can be written to go with each picture and once a screenful of 12 lines has been completed, the display scrolls up.

Good use is made of the function keys dealing with inserting lines, justifying and centring text, copying or deleting blocks and printing. One of the function keys also calls up a rather good 22,000 spelling checker with the option for children to add 1000 words of their own. Usefully, the spell-checker can be used outside *Mystery Island* – nice bonus.

Children find *Mystery Island* just what they want to link together their ideas and thoughts through the media of both pictures and words. The program offers a new electronic means of composition. As well as viewing work on the screen by flicking through the pages it is possible to produce hard copy too. Pictures and text can be printed out with the built in screen dump for Epson compatible or Integrex and Canon printers.

When children do use *Mystery Island* almost anything can happen. What happens is for them to decide, not the teacher or the programmer!

Adventure Island *is published by Ginn & Co, Prebendal House, Parson's Fee, Aylesbury, Bucks HP20 2QZ for £29.95.* Rescue: An Island Adventure *is published by Cambridgeshire Software House, The Town Hall, St Ives, Huntington, Cambridgeshire PE17 4AL for £18.* Mystery Island *is published by Tressell Publications, 70 Grand Parade, Brighton BN2 2JA and it costs £20.*



SERIES

Introduces:

NOAH PROFESSIONAL PAINT

the compatible graphics program for the Archimedes

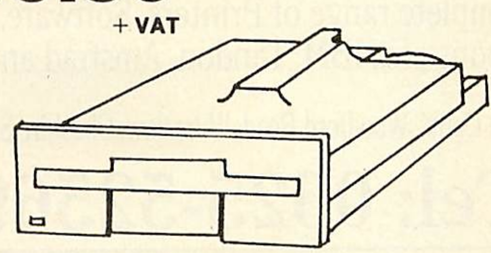
able to load EVERY graphics format (also Amiga and Atari)
supports all Archimedes hardware upgrades
printer drivers for standard colour-printers (ink and matrix)
two versions : 256 colours and 16 colours
fully SPRITE oriented graphics and VECTOR fonts
amazing colour statistics and filters
very fast three-dimensional part
realtime magnifier
online helptexts
very easy to use

price in UK excl. VAT 129,-

GMA mbH, 38 Upper Wellheads, Limekilns, FIFE, Scottland

3½″ 1mb. DISC DRIVE

£49.50
+ VAT



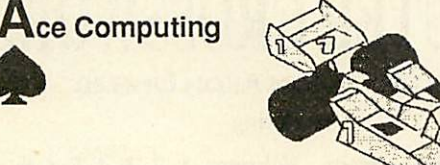
Japanese-made (Y-E data) high reliability, modern, low component chassis drives. Surface mount design. These drives are ex-equipment, in immaculate 'as new' condition, boxed, and carry a full 6-month (money-back-if-not-satisfied) guarantee.

£49.50 each (carr. £3.00), £44.50 for ten or more, 25 or more p.o.a. box of ten 3½″ disks £9.75. VAT must be added to all prices.

Access or Visa accepted by telephone

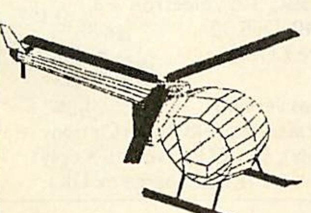


Matmos Limited Electronics
Unit 11, The Enterprise Park
Lewes Road, Lindfield, West Sussex
RH16 2LX
Telephone: (04447) 2091 or 3830
Fax: (04447) 4258



RISC OS EUCLID IS HERE!

You've got RISC OS – fun isn't it?
Here's something to stretch it..:



- Multidocument 3-D Editor
- Simple, intuitive, icon driven, single window interface
- Object orientated data structure
- Curved surface primitives
- Cameras and lights
- Grid locking and measurement facilities
- Import and Export to 2-D packages

EUCLID - Explore a new dimension!
Price: £70 (inc VAT and P&P).

Available by mail order from:
Ace Computing, 27 Victoria Road,
Cambridge CB4 3BW.
Tel: (0223) 322559.
Or from your local dealer.



MAIN MEDIA

FREEPOST, ANDOVER,
HANTS SP10 4BR

UNBRANDED LIFETIME GUARANTEE

	QUANTITY	10	20	30	40	50	100
31/2″ SS/DD	135TPI	£7.95	£15.50	£22.75	£29.50	£35.75	£69.95
31/2″ DS/DD	135TPI	£8.50	£16.50	£23.95	£31.25	£37.95	£74.95
	QUANTITY	25	50	100	250	500	
51/4″ DS/DD	48TPI	£7.25	£13.95	£26.95	£64.95	£124.95	
51/4″ DS/QD	96TPI	£7.95	£15.50	£29.95	£77.50	£139.95	

All 31/2″ Disks come complete with labels. All 51/4″ Disks supplied with Write Protect Tabs, labels and envelopes and come with our No Quibble Money Back or Replacement Guarantee.

1 WEATHERBY GARDENS, CHARLTON, ANDOVER, HANTS SP10 4DH

DISKETTE STORAGE BOXES

		Price Each
50 x 51/4″	Hinged Lid Lockable	£5.50
100 x 51/4″	Hinged Lid Lockable	£7.50
140 x 51/4″	Hinged Lid Lockable	£9.50
50 x 31/2″	Hinged Lid Lockable	£5.50
100 x 31/2″	Hinged Lid Lockable	£7.50

DISK BOXES WITH DISKS

50 x 51/4″	Hinged Lid Lockable with	25 DS/DD	48TPI	£11.95
50 x 51/4″	Hinged Lid Lockable with	25 DS/QD	96TPI	£12.75
100 x 51/4″	Hinged Lid Lockable with	50 DS/QD	48TPI	£20.95
100 x 51/4″	Hinged Lid Lockable with	50 DS/QD	96TPI	£22.50
140 x 51/4″	Hinged Lid Lockable with	100 DS/DD	48TPI	£35.95
140 x 51/4″	Hinged Lid Lockable with	100 DS/QD	96TPI	£38.95
50 x 31/2″	Hinged Lid Lockable with	20 DS/DD	135TPI	£21.50
100 x 31/2″	Hinged Lid Lockable with	50 DS/DD	135TPI	£44.95

All prices include VAT and Carriage.
All Goods despatched withn 24 hours subject to availability.
Cheques/P.O.'s to:

MAIN MEDIA, Dept AU
FREEPOST, ANDOVER, HANTS SP10 4BR
Telephone: 0264 333830 (24 hours) CREDIT CARD HOTLINE

LETTERS

BBC Acorn User, 20-26 Brunswick Place, London N1 6DJ. BTG/TTNS 81:RED001

HELP WITH HANDICAPS

I am researching the use of computers with mentally handicapped people on behalf of Sheffield Social Services. The aim is to draw up guidelines for the Mentally Handicapped Training Centres under that body's authority. My initial investigation shows that those centres which are using computers invariably possess BBC model Bs and Masters. This has caused problems which I would like to outline.

Acquisition of hardware and software has tended to be ad hoc – uniformed by any clear ideas about what the centres hope to gain from its use. Disappointment, staff hostility, and even the purchase of equipment which is never used, is often the result.

Apart from the problem of 'Mental' handicap ruling out a great deal of mainstream software (be it games, educational or other), problems of motor co-ordination are common. Some software is inappropriate simply because it demands too much in the way of manual dexterity.

Very little has been written in the computer press about either available products or current thinking in this (I believe) very hungry area of microcomputer applications. Can anyone help me out?

Philip Roddis
Sheffield

We suggest these three companies and would like to hear from any others.

Ray Wood, Nordis Software, Cornhill Close, Lodge Farm Industrial Estate, Northampton NN5 7UB. Tel. (0604) 54358. David Colven, ACE Centre, Ormerod School, Waynflete Rd, Headington, Oxford OX3 8DD. Tel. (0865) 63508. Richard Pourtney, MESU, Sir Williams Lyons Rd, Science Park, University of Warwick, Coventry, CV4 7AZ. Tel. (0203) 416994.



MUM KNOWS BEST

As a teacher, I have always found the educational pages of *BBC Acorn User* to be informative and accurate. However, I must write to correct a piece of 'utter rubbish', published in the May issue under the title 'School Report'.

Drage would take note, I gasp with horror at their comments that parents may be spoiling future classwork for teachers by using educational software packages at home.

It is attitudes of this type which reinforce the myth that parents ought not take responsibility for their childrens education, but should leave it to the 'professionals'.

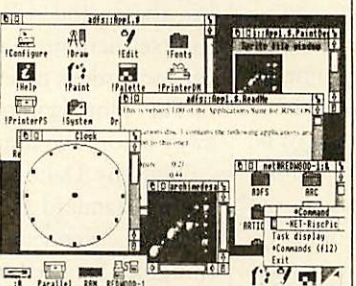
Parents do not need your discouragement. Most are more than capable and could probably show these teachers a thing or two. Well done Mums and Dads! Continue to develop your childrens interests and abilities in as many ways as you can.

John Sisson
Derby

WAITING FOR RISC OS

I have been a dedicated user of Acorn machines for nearly four years now from BBC B to Arc and only now I am very angry with Acorn on the subject of Risc Os.

Risc OS has been reviewed by many magazines over the past five months since it was first shown by Acorn. I have read most of these reviews



and they have all said how wonderful Risc OS is. Acorn has now had around four months to mass produce the product which should be enough time.

So in February, I placed an order with my Acorn dealer and waited eagerly for April to come round. But have since been told that I would have to wait until around May.

Surely Acorn realise they have an excellent product on their hands and I would have thought that they could have got it right this time.

S Mansfield
Margate

Acorn has in fact underestimated the impact that Risc OS has made. A number of top dealers, such as Watford and Technomatics, have also expressed concern over the slow and limited delivery of the new Risc OS Roms. Commenting on the delivery problems Acorn's product manager David Bell, Acorn's product manager said, 'the problems are due to the lead time in getting Roms out of Japan, however I expect the backlog to be cleared by July.'

MASTER TOOLKIT

I am looking for a Basic Toolkit for use on the Master 128. The Beebug Toolkit would have been ideal, but it doesn't work on the Master.

P Burton
Glasgow

A number of toolkit Roms exist that are designed specially for use with the Master 128. Most have been written to add the ADFS commands such as *FORMAT, *VERIFY etc that were missing from the original MOS. MOS+ from Dabs Press has these, plus alarm functions that make use of the Master's real-time clock.

GAMES

I was about to start this with 'bad news for *Bolo* fans' until I remembered that no one has actually got the game yet. And they're not going to either, at least not under the Go-Dax label.

Martin Maynard at Go-Dax has decided to abandon the project, and all software of any sort for that matter.

So the author, Delos *'Joust'* Harriman has had to start searching for someone else to market his game. So far he's been unsuccessful but he told me that there's no way he will give up easily.

The trouble is that the game requires at least three micros to show its potential, and preferably 16! This means that the most obvious customers are schools. They have the required hardware but although the combination of arcade games and school may appeal to the children, it doesn't to the balance sheet and unfortunately this is what counts. However Delos is determined, and has threatened to market the game himself if all else fails.

The fact that the game is best played on lots of computers can be thought of as a distinct advantage. Why not get some friends with computers to pool together with you to buy the game? This would drastically cut the price and make the whole thing very worthwhile.

It's sad, but many software houses, when asked, have said the Archimedes market is too small for much effort. Let's face it, the power of the Arc has yet to be exploited and it needs a good programmer with time and the promise of cash to sit down and produce something good.

So far no one has deemed the market profitable enough in this respect to invest any significant amount of money, including big companies like Superior and Grandslam who have temporarily halted Archimedes development.

I say temporarily because Acorn has produced a machine which will hopefully solve the problem. The new Archimedes A3000 to replace the 310 comes with 1Mb of memory as standard (that's double the standard capacity of the ST and Amiga!). It also features stereo speakers and will be self-contained in a single box about the same size as a Master – sounds a lot like a designated games machine to me!



Predator; the exciting new game from Superior software, based on the well-known Scwarzenegger movie of the same name

Let's hope some games companies feel I'm correct enough to give it a second chance.

Domark, *(Star Wars, Empire Strikes Back)* has finally released the sequel, *Return of the Jedi,* despite having initially decided to omit it from the trilogy. I won't go into any detail now because you can read the review here!

Domark is also working hard to coincide business with the release of the latest James Bond film *Licence to Kill*, out in the summer. Traditionally Domark has always coded Bond's character down to pixel definition and this latest espionage escapade is no exception.

The plot (without giving too much away before the film) is as follows:

Timothy Dalton is granted leave from boring standard missions and takes on a personal vendetta against arch-drug smuggler Sanchez and the tentacles of his dealer network. According to Domark's Clare Edgeley the computer plot closely follows that of the film.

In the game you control Bond through a helicopter chase, an underwater scene where you must dodge the sharks and Sanchez' thugs and finally in a stolen crop duster where you find yourself attempting to prevent Sanchez escaping with a massive haul of drugs hidden in a convoy of petrol tankers! Exactly how, she has yet to reveal. Amiga, ST, PC, Amstrad and Speccy owners get their copies in June but the humble Beeb will have to wait a couple of months longer. (Keeping the best for last, huh?).

Impact is working on another BBC game, this time called *White Magic*. Steve Botterill is currently keeping as quiet as possible about it to build up some suspense – but he did mention that it was a bit like *Gauntlet* in the sense that it will be an arcade adventure with a choice of four characters.

So far I don't know whether the four, namely a leprechaun, a Titan, a warrior and an enhancer (presumably the equivalent to a wizard) can be played together or only one alone.

The game is being sold under the Fourth Dimension label, the team responsible for both the BBC and Archimedes versions of the excellent *Holed-Out!*

Superior is onto another licensing deal in an effort to fill the *BAU* back cover advert when the *Play it Again Sam* series runs out (at ten).

From Psygnosis, *Ballistix* is, as they say, a 'whole new ball game' which takes place in a futuristic football stadium. Playing against either the computer or a friend, you fire metal balls around a far from the simple stadium into the two goals. There are plenty of complications, coming in the form of magnets, tunnels, splitters, bumpers and red arrows which increase the velocity of any ball that runs over them.

The game derives from the Amiga/ST format and employs complex imagery so I find it difficult to visualise a BBC micro version without images of blocky, confused graphics clouding my thoughts. Superior has moulded itself a reputation for taking on difficult projects and *Ballistix* will certainly not be easy!

Before I finish, I would like to remind you that we still have Bubblebus' *Starquake* maps on offer for £1. Send a cheque and an SAE to The Games Page, (hopefully accompanying some cheats or high scores, but these aren't necessary) at *BBC Acorn User,* 20-26 Brunswick Place, London N1 6DJ.



Return of the Jedi; Domark, BBC B, B+ cassette £9.99, Master disc £12.99.
Return of the Jedi finally completes the *Star Wars* set but frankly this is nothing to celebrate. After two very promising intergalactic games, *Jedi* is something of a letdown.

The first wave places you in the persona of Leia in the hot seat of a speeder bike. Your task is to race through the forest to the Ewok village, knocking off or shooting the pursuing Imperial Stormtroopers.

Another way to eliminate them is to lead them through a trap set by the Ewoks. The second rider through is always the unlucky one, being either crushed between logs or knocked off by a taut vine.

The viewpoint attempts to give a three dimensional view of the scene and although in this it succeeds, it makes estimating the distance between yourself and trees very tricky.

The game has been written in mode 0 which although it gives high resolu-tion doesn't allow more than two colours and the bright yellow background can really hurt your eyes.

The Stormtroopers are pretty pathetic and the most effective deterrent is to do absolutely nothing! They come quietly up to you and give you a few nudges before hitting a tree or something.

It is too easy to avoid them and too difficult to avoid the traps - I have yet to make it accurately through a log trap without smashing into a little Ewok!

Although there are three levels of difficulty, these are virtually identical and after a few games, indistinguishable.

When the Ewok village is reached, the little bears all dance up and down in joy. However the celebrations are short lived and you soon find yourself in a Scout Walker wobbling about under the control of Chewbacca.

The idea here is much the same only this time you are leaping out of the way of logs and rocks. These come too quickly to avoid no matter which level you happen to be on!

After the bunker is reached and blown up, releasing the protective shield surrounding the Death Star, the *Millenium Falcon* can swoop in, fly down a tube to the centre and shoot the central reactor which Darth has foolishly neglected to protect after his last Death Star was destroyed using the same method.

Return of the Jedi is obviously a rushed job and while it does hold a few nice twists I can't recommend it even if you are a dedicated George Lucas fan.

Sam Greenhill

Blood of the Mutineers; Robico Software, BBC B, B+, Electron, £14.95 (disc) £12.95 (tape).
As soon as it had finished loading, I suspected this adventure was going to be good – and prove to be nearly impossible. And I was right!

The game itself is huge and room descriptions are very good, if a little over the top – the captain's cabin manages to occupy the whole of one screen!

The parser is certainly one of the best that I have ever used, allowing multiple statement lines, the use of IT,BUT,ALL, etc and a very useful undo facility for when you find yourself in a bit of a tight spot. However, it seems you cannot undo if you have just died, which would appear to me to defeat the whole object of its existence!

The game is fairly difficult to start off and it took me a while to get into the swing of things. If anyone else is in this situation, you'll find it helps to close and lock the door!

The puzzles are taxing and I believe a player would be hard pushed to complete the game without some aid. Some puzzles are near impossible to guess at and some subtle clues left lying around would have helped.

One thing you either love or hate is messages like 'Talk straight, shipmate' or 'Please specify, matey'. I found they added to the atmosphere at the start but then became rather annoying.

After spending several attempts to solve a problem with various permutations of a command, the message 'You speak in riddles, matey' is nothing more than an irritation.

There is an option to select text in either black and white, or yellow and white. Perhaps this is for a hard copy, though I found no built-in way to dump to the printer.

Loading and saving to tape or disc is supported and so is the command WHERE which I would normally only expect to find on multi-user adventures. If you discover you have left something behind, you can always use this facility to discover its location.

This game is certainly one of the best adventures I have played. If you want something to sit at while waiting for summer to arrive, I recommend you buy it with haste.

Paul Thornton



Ibix the Viking; Minerva, £19.96 for Archimedes only.
In this, Minerva's eighth game release, you play the part of a marauding viking by the name of Ibix. It is your task in life to wander the land, looting, pillaging and generally having a good time.

There are plenty of 'meanies' out to stop you but a quick flick of the wrist with your dagger should stop all but the meanest in their tracks.

Anyone familiar with *Hoverbod* (Minerva's second game) will know what to expect – *Ibix* is remarkably similar to look at and to play.

Graphics are best described as 'cute', with small, detailed sprites making up the majority of the scenery. Sound is up to the usual standard, with various sampled squeaks and grunts, squeaking and grunting at the appropriate moment.

However, the sounds in the production version of the game will be different, forming the basis of a 'spot-the-sound' competition to be launched by Minerva.

As well as the sound effects, there is also a vaguely musical bleeping in the background. It's a shame that Minerva couldn't have dispensed with the sampled effects and instead, had a 'proper' jolly tune to loot and pillage to.

The plus point *Ibix* has inherited from *Hoverbod* is the graphics which were also 'cute n' colourful'. Unfortunately *Ibix* has also got the same lousy gameplay.

Sprites tend to flicker and jerk around the screen, and control of Ibix himself is often sluggish and unresponsive. Fortunately there is a lot more to do, problems

to solve, keys to collect and so on although this hardly compensates.

The only thing that can possibly save *Ibix* is the inclusion of a game designer. This is a complex section and allows all sprites to be redesigned as well as changing the behaviour of the meanies for different situations.

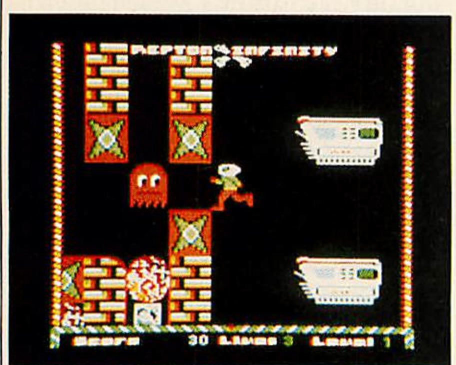
Scenery can be designed to any specification including animated pieces such as portcullisses or clocks.

You can also add your own sound samples, that can be triggered by some action. Perhaps a 'squishy' sound as you inadvertently step under a falling block...

Ibix is a bit steep at £20 but Minerva is using the inclusion of the game designer to justify this. The game included with the package is pretty simple though you will get better results if you are willing to persevere.

I would only recommend this to hardened arcade adventurer or perhaps to *Hoverbox* fans (if such persons exist).

Rob Miller



Repton Infinity; Superior Software, Cassette for BBC micro, Electron £12.95, disc for Master £14.95 and for Compact £19.95.

This is the latest (and final?) offering from Superior in the seemingly never-ending *Repton* series. It is primarily an editor, allowing you to customise not only the map and the graphics (as in *Repton 3)* but also the behaviour of all the sprites in the game.

This is achieved by using three editors ('Landscape', 'Blueprint' and 'Filmstrip'), each of which produces a file used by a fourth program, the Linker, to create a game file. Finally, this is loaded into the game program.

Each editor allows you to place your name in the datafile, which is eventually used by the game against the title credits. The game comes with a function key reminder card to help you remember the various keys for the editors, and a large and well-written manual explaining how to use the editors. There are three discs (or two cassettes), one containing the programs and the others holding datafiles. The data discs contain four games, each in two parts – *Repton 3 Take 2*, *Repton 4*, *Robbo*, and *Trakker*. These contain such creations as dynamite, pipelines, magiblocks and of course the photocopier!

The Filmstrip editor is the graphics editor. You can change the large game sprites, the map characters and the set of characters displayed at the bottom of the screen in the editors. These are saved in two files – one containing the sprites and map characters and the other containing the characters used by the editors. The latter can be loaded into the other editors to make editing easier.

Other useful features are the ability to copy graphics from one sprite to another, reflect the grids along horizontal or vertical axis, and also the ability to 'underlay' the space character for background design. Animated sprites, such as Repton himself, can also be tested.

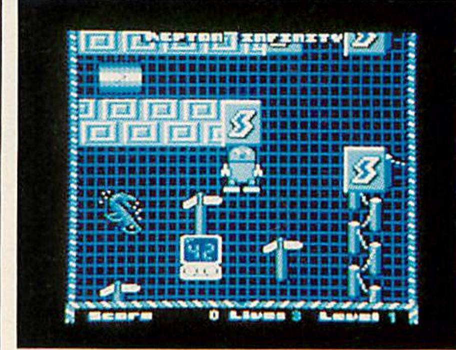
The Landscape editor is used to design the four screens Repton will have to negotiate. It has a 'fill screen' facility, and in addition the DELETE key will insert a space. Moving the cursor onto a teleport displays the destination as well with a blinking T cursor – also used to select the destination when placing one of the six teleports.

Each screen also has a number of other options to hide the map and to make the level accessible only by a password. Finally, you have to set the 'minimum score' for the level. When your score reaches this value for the level, the screen flashes, a fanfare is played and you can then progress to the next level after being told the password. A useful calculator is built into the editor to help calculate this.

The Blueprint editor is by far the most complex of the three. You describe the behaviour of each sprite in a language called 'Reptol' which is then compiled to produce code used by the Linker.

Although the set of commands is sparse, this language is incredibly versatile – in a short while, I was able to change the game into something very similar to *Pac-Man*! Sadly, the shortage of memory restricts you in the complexity of the definitions. The definition is split into three sections: Type, Action, and Hits. These define flags associated with the sprite, how it behaves normally, and what happens if something moves on top of it. You can also give a name to an object so that you can refer to it from other definitions.

The Linker is where you create the game data file, used by the game itself,



from all the others. At this stage you also enter two lines of text – one to be displayed on the title screen and the other when the player has completed all four screens.

A description of the game itself is somewhat difficult since it can be redefined out of all recognition but there are a couple of major differences from *Repton 3*.

Moving sprites can no longer run under stationary sprites – such as the sprites in *Repton 3* moving under the earth without deleting it.

Also, to complete a screen, you wait until the fanfare sounds and then press 'tab'. Lastly, when viewing the map all the other sprites in the level keep on moving!

The BBC Master has (as is now usual) an enhanced version of the game. All the editors and the game load into sideways Ram and you can swap between them retaining the data which is currently in the section.

This makes testing much easier and is especially useful in Blueprint to test your code. The Linker has a new option to save all the data at once in one large file but unfortunately there is no confirmation to the save or load and it is very easy to overwrite your data.

Repton Infinity is a definite must for any disc user who prefers a little thinking to straightforward 'zap the aliens' type of software. However, cassette users may find the constant file saving and loading a bit tedious.

The game can be fully redesigned, and so it is unlikely to lose its appeal in the near future. The only problem is – having reached infinity, what do they call the next one?

Steven Shipway

BARGAIN GAMES!!

WHITE MAGIC (The Fourth Dimension)

Following the immense success of Holed Out, The Fourth Dimension have now released a unique new fast-action arcade adventure called WHITE MAGIC. You can at any time transform into a Leprechaun, Enchanter, Titan or Warrior in order to use their much needed varied abilities. A sure-fire hit. For more details ring the Impact Newsline.

BBC/Electron Cassette £9.95 BBC B/Master 5 1/4" Disc £12.95
Enhanced Archimedes version available mid July at £19.95

FREE HELPSHEETS/MAPS

Spend over £4 on games and you may choose **ONE** of the following helpsheets/solutions and maps absolutely **FREE**.
Spend over £10 and you may choose any **TWO FREE** :-

Pipeline (Helpsheet + 4 maps)
Village of Lost Souls (Helpsheets)
Impact Jokes (Lots of jokes)
Impact Jokes 2 (Lots more jokes)
Shark (map)
Spycat (Solution + map)
Plan B (Solution + map)
Zarch (Helpsheet)
Stryker's Run (Electron map)
Ziggy (Solution + maps)
Future Shock (Solution + map)
Aneoff (Solution + map)
Return of R2 (Map + tips)
Bug Eyes 2 (Map)
Myorem (Solution)
The Lost Crystal (Solution + maps)
Imogen (Solution + 16 maps)
Quest (Solution + map)
Ravenskull (Solution + 4 maps)
Last of the Free (Solution + map)
Starfighter (Helpsheet + map)
Corruption (Solution)
Golden Figurine (Solution + maps)
Enthar 7 (Solution)
Exile (Helpsheet)
Terramex (Solution)
The Hobbit (Solution)
Citadel (Solution + map)
Plan B2 (Solution + map)
Spy Vs Spy (Helpsheet)
Spellbinder (Solution + maps)
Elixir (Solution + maps)
Paperboy (Helpsheet)
Twin Kingdom Valley (Solution + map)
Omega Orb (Solution + map)
Elite (Helpsheet + tips)
Tarzan (Solution + map)
Stranded (Solution)
Codename : Droid (Solution + map)
Thunderstruck (Solution + map)
Suds (Solution)
Philosopher's Quest (Solution + map)
Rick Hanson (Solution)
Thrust (Maps)
Last Ninja (Solution + maps)
Exile (Helpsheet - Part 2)
Hoverbod (Passwords + cheats)
Frak! (Helpsheet)
Thunderstruck 2 (Solution + map)
Kourtyard (Helpsheet + map)
Dunjunz (Helpsheet + 25 maps)
Gisburnes Castle (Solution + map)
Palace of Magic (Solution + map)
Impact (Helpsheets + passwords)
Icarus (Helpsheet + maps)
Sphinx Adventure (Solution + map)
Anarchy Zone (Helpsheet + passwords)
Repton 2 (Helpsheet + 18 maps)
Bonecruncher (All passwords + maps)
Skirmish (Helpsheet)
Cholo (Solution)
Quest for Freedom (Solution + map)
Kayleth (Solution)
Starquake (Helpsheet)
Rick Hanson 2 (Solution)
The Hunt (Solution)
Sabre Wulf (Helpsheet + map)

ARCHIMEDES GAMES

Holed Out (3D Golf) (The Fourth Dimension)	19.95
Cheat It Again, Archie (Impact Software)	9.95
Quazer (Impact Software)	9.95
Startrader (Gem)	16.95
Word Up & Word Down (Gem)	16.95
Pacmania (Grandslam)	15.95
Repton 3 (Superior)	15.45
Rise in Crime (Robico)	24.95
Jet Fighter (Minerva)	11.95
Corruption (Rainbird)	19.95
Fish (Rainbird)	19.95
Fireball (Godax)	15.95
Orion (Minerva)	11.95
Freddy's Folly (Minerva)	11.95
Alerion (Dabs Press)	12.95
Terramex (Grandslam)	15.95
Zarch (Superior)	15.45
Hoverbod (Minerva)	11.95
Missile Control (Minerva)	11.95
Thundermonk (Minerva)	11.95
Minotaur (Minerva)	11.95
3D Pool (Firebird)	16.95

ELECTRON DISCS

3½ DISCS
Elixir / Palace of Magic
Play It Again Sam
£11.95 each

5¼ DISCS
Elixir / Palace of Magic
Bonecruncher / P. I. A. Sam
£11.95 each

MASTER COMPACT 3 1/2" DISCS

Ransack *£5.95* Spitfire '40 *£9.95*
Ziggy *£7.95* Omega Orb *£5.95*
Despatch Rider *£5.95*

M = Master Compatible

TITLE & PUBLISHER	BBC or Electron Cassette	BBC 5 1/4" Disc	Master Compact 3 1/2" Disc
IMPACT SOFTWARE (Discs are BBC B & Master Compatible 40/80)			
Orbital M	4.95	5.95	6.95
Clogger M	4.95	4.99	6.95
Zenon M	4.95	4.99	6.95
Cheat It Again, Joe 1	2.99	4.99	-
Cheat It Again, Joe 2	2.99	4.99	-
Cheat It Again, Joe 3	2.99	4.99	-
THE FOURTH DIMENSION			
Holed Out (3D Golf) M	9.95	11.95	12.95
White Magic M	9.95	12.95	13.95
SUPERIOR			
Play It Again Sam 9 M	6.90	8.90	11.25
Play It Again Sam 8 M	6.90	8.90	11.25
Play It Again Sam 7 M	6.90	8.90	11.25
Barbarian 2 M	6.90	8.90	11.25
Question of Sport M	9.50	11.50	15.70
Play It Again Sam 6 M	6.90	8.90	11.25
Last Ninja M	6.90	8.90	11.25
Repton Infinity M	9.45	11.45	15.75
Play It Again Sam 5 M	7.25	9.50	11.50
Exile M	9.45	11.45	15.75
By Fair Means or Foul M	6.90	8.90	11.25
Play it Again Sam 4 M	7.25	9.50	11.50
Play It Again Sam 3 M	6.90	8.90	11.25
Pipeline M	6.90	8.90	11.25
Repton Thru Time M	5.50	6.50	7.50
Barbarian M	6.90	8.90	11.25
Spycat M	6.90	8.90	11.25
Play it Again Sam 2 M	6.90	8.90	11.25
Bonecruncher M	6.90	8.90	11.25
Spellbinder M	7.25	9.50	8.95
Play it Again Sam M	6.90	8.90	11.25
The Life of Repton M	5.50	6.50	7.50
Elixir M	6.90	9.50	9.95
Palace of Magic M	6.90	8.90	11.25
Repton Around the World M	5.50	6.50	7.50
Crazee Rider M	6.90	8.90	11.25
Codename: Droid (Stryker's) M	6.90	8.90	11.25
Grand Prix Cons. Set M (BBC only)	7.25	9.50	8.95
Repton 3 M	6.90	8.90	11.25
Quest M	6.90	8.90	11.25
Elite M	9.45	11.45	15.75
Acornsoft Hits 1 M (BBC Only)	3.99	-	11.50
Acornsoft Hits 2 M	2.99	-	11.50
Sup. Coll. 2 (BBC only) M	7.25	9.50	-
Superior Coll. 3 (Elec Only)	7.25	-	-
Citadel M	2.99	8.90	11.25
Ravenskull M	2.99	8.90	11.25
Thrust M	2.99	8.90	11.25
Galaforce M	2.99	8.90	11.25
TYNESOFT			
Superman M	6.90	10.95	-
Circus Games M	6.90	10.95	-
Summer Olympiad M	6.90	11.25	11.25
Saigon M	7.25	-	-
Winter Olympiad '88 M	6.90	8.90	11.25
Spy vs Spy M	7.25	-	-
The Big K O M	6.50	10.50	10.50
Boulderdash M	-	-	9.95
Indoor Sports M	7.50	11.95	-
Commonwealth Games M	6.50	11.95	-
Future Shock M	7.50	11.95	11.95
GODAX			
Skirmish M	4.95	6.95	6.95
Kourtyard M	5.95	6.95	6.95

TITLE & PUBLISHER	BBC or Electron Cassette	BBC 5 1/4" Disc
A + F		
Chuckie Egg	3.99	-
ACORNSOFT		
Aviator (BBC Only)	3.99	-
Revs & Revs 4 Tracks (BBC B Only)	3.99	11.95
ASL		
Shark M	7.25	9.25
Breakthrough M	4.95	7.95
Impact M	7.25	9.50
Powerpack 2 (Elec Only)	5.95	-
Ziggy M	5.95	8.95
Ransack M	7.50	9.50
Thunderstruck	4.95	-
Thunderstruck 2	4.95	-
Sphere of Destiny M	5.95	9.50
Omega Orb M	-	5.95
Graham Gooch Test Cricket M	6.95	9.95
BEAU JOLLY		
Five Star Games 1 (5 games)	3.99	-
Five Star Games 2 (5 games)	3.99	-
Five Star Games 3 (7 games)	7.25	-
Computer Hits 2 (BBC Only) (10games)	3.99	-
Computer Hits 3 (10 games)	4.95	-
Computer Hits 4 (12 games)	7.25	-
Computer Hits 5 (5 games)	3.99	-
BUGBYTE		
Bugbyte Comp 1 (4 games) M	-	4.99
Bugbyte Comp 2 (4 games)	-	4.99
Dunjunz M	2.99	-
CDS		
Tank Attack M	9.95	11.95
Football Director M (BBC Only)	7.50	10.95
Colossus Bridge M	10.95	12.95
Colossus Chess M	7.50	12.95
Steve Davis Snooker M	1.99	4.99
Brian Clough Football M	5.95	7.95
CODA SOFTWARE (State 40 or 80 track)		
Headcoach M	-	15.95
DATABASE SOFTWARE		
Mini Office	4.95	-
Starquake (BBC Only) M	7.50	9.50
Mini Office 2 (BBC B Only)	12.95	14.95
Mini Office 2 (Master Disc)	-	15.95
Fun School 2 M:		
Under 6's M	7.50	9.95
6 to 8 Years M	7.50	9.95
Over 8's M	7.50	9.95
DOCTORSOFT		
Phantom Combat M	2.99	4.99
DOMARK		
Empire Strikes Back (BBC Only) M	6.90	9.70
Not a Penny More (BBC Only) M	6.95	6.95
Star Wars M	6.90	9.70
Return of the Jedi (BBC Only) M	7.25	10.95
Trivial Pusuits (All BBC Only) :-		
Genius Edition M	12.50	15.95
Baby Boomer M	12.95	16.95
Bulls Eye (BBC Only)	7.50	-
Countdown (BBC Only)	7.50	-
Blockbusters (BBC Only)	7.50	10.95
EPIC SOFTWARE		
The Lost Crystal (BBC Only)	8.95	-

TITLE & PUBLISHER	BBC or Electron Cassette	BBC 5 1/4" Disc
ELK ADVENTURE CLUB		
Starship Quest	3.95	-
Magnetic Moon	3.95	-
FIREBIRD		
Sentinel (BBC Only) M	7.25	9.50
Cholo (BBC Only) M	-	15.95
3D Pool	7.95	9.95
GREMLIN GRAPHICS		
Krakout (BBC Only) M	6.95	9.95
IMAGINE		
Yie Ar Kung Fu 2 (Elec Only)	6.95	-
INCENTIVE		
Moon Cresta (BBC Only)	1.99	4.99
LOGOTRON		
Xor M	5.95	-
LOTHLORIAN		
Roundheads (BBC Only)M	-	9.95
MANDARIN		
Lancelot (80 Track Only BBC B with sideways/shadow RAM, B+, Master) M	-	12.95
Icarus M	7.50	9.95
Time and Magik (80 Track Only BBC B with sideways/shadow RAM, B+, Master) M	-	12.95
MARTECH		
Tarzan (BBC B Only)	-	4.99
War (BBC Only)	-	3.99
MASTER GAMES		
Scott Adams Scoops (BBC Only)	6.95	-
MICROPOWER		
Imogen M	7.25	9.50
Micropower Magic 1 (BBC Only)	4.95	-
Micropower Magic 2 (BBC Only)	4.95	-
Stockcar (BBC Only)	-	6.95
MIRRORSOFT		
Mastermind & Quizmaster	2.99	-
Tetris M	2.99	4.99
Spitfire '40 M	5.95	-
Strike Force Harrier	3.99	-
ROBICO		
Island of Xaan M	-	10.95
Rick Hanson Trilogy (BBC Only) M	17.95	-
Project Thesius M	8.95	11.95
Myorem M	-	10.95
The Hunt (BBC Only) M	7.95	-
U.S. GOLD		
Rebel Planet (BBC B Only)	4.95	-
Temple of Terror (BBC B Only)	4.95	-
WHITE PANTHER		
Infinity (BBC Only) M	7.50	11.95

THE 1989 BBC ACORN USER SHOW

Alexandra Palace, London
Stand No. 60
Come and meet us at this superb location for the show of the year. You'll be able to try some of the latest games and there'll be bargains galore on software and hardware. Ring our newsline for full details.
21st to 23rd JULY

HOLED OUT!!

This superb **3D Golf** game is now available at discount prices from Impact. **Holed Out** is probably the best game release this year and is highly recommended.

(Prices above & opposite)

BUDGET TITLES
BBC B or Electron Cassettes

ALL ONLY £1.99 EACH

Alien Dropout (Elec only)
Anarchy Zone
Bar Billiards
Blitzkrieg (Elec only)
Boxer (Elec only)
Chess (Elec only)
Creepy Cave
3D Dotty
3D Maze (Elec only)
Darts
Deathstar
Flight Path 737 (Elec only)
Frankenstein 2000
Gisburnes Castle
Golden Figurine
Golf
Graham Gooch Cricket (Elec only)
Grid Iron
Gunsmoke (Elec only)
Hyperdrive (Elec only)
Indoor Soccer (Elec only)
Invaders (Elec only)
Jetpac (BBC only)
Joe Blade 1
Joe Blade 2
Magic Mushrooms (BBC only)
Monkey Nuts
Moon Cresta (BBC only)
Mr Wiz
Nuts (BBC only)
Panic
Pegleg (Elec only)
Percy Penguin
Peter Scott Trilogy (BBC only)
Psycastria
Round Ones
Smash and Grab
Snapper (Elec only)
Snooker (BBC only)
Soccer Boss
Starship Command (Elec only)
Steve Davis Snooker
Stormcycle
Styx
Superpool (Elec only)
Swoop
Tempest
Thai Boxing (Elec Only)
Triple Deckers 1 - 10 (1.99 each)
UK PM (Elec only)
Vegas Jackpot
Video Card Arcade
Wet Zone (Elec only)

ALL ONLY £2.99 EACH

Acornsoft Hits 2
Arcadians (Elec only)
Beachhead (BBC only)
Citadel
Commando
Cricket
Croaker
Drogna (BBC only)
Dunjunz
Felix in the Factory
Felix / Fruit Monsters (Elec only)
Football Manager
Footballer of the Year
Frenzy (Elec only)
Galaforce
Ghouls (Elec only)
Hopper (Elec only)
Hunkidory
Karate Combat
League Challenge
Megarock (BBC only)
Meteors (BBC only)
Mr Ee (BBC only)
Phantom Combat
Plan B
Plan B2
Pro Golf
Ravenskull
Repton
Repton 2
Roboto
Rocket Raid (BBC only)
Sphinx Adventure (Elec only)
Squeakaliser
Star Force Seven
Strykers Run
Survivors
Tennis
Thrust
Twin Kingdom Valley
Uranians
Warehouse

IMPACT NEWSLINE

For the very latest news ring: 0898 654334

25p per minute cheap rate; 38p all other times
(if you are using your parents phone please ask for their permission first)

Now updated every week, the newsline is a superb way of keeping up to date with the latest releases, games news, bargains and the top 5 best-selling games of the week.

SIMPLY FILL IN THIS COUPON AND SEND A CHEQUE OR POSTAL ORDER TO IMPACT SOFTWARE.

- All games despatched by 1st class post.
- **FREE** postage and packing (U.K.only).
- Despatch normally same day as order.
- Minimum orders £3.00.
- Telephone orders welcome.

TELEPHONE ORDERS WELCOME
24 HOUR SERVICE 7 DAYS A WEEK




IMPACT Software
(0742) 769950
Impact Software
Neepsend House
1 Percy St
Sheffield S3 8AU

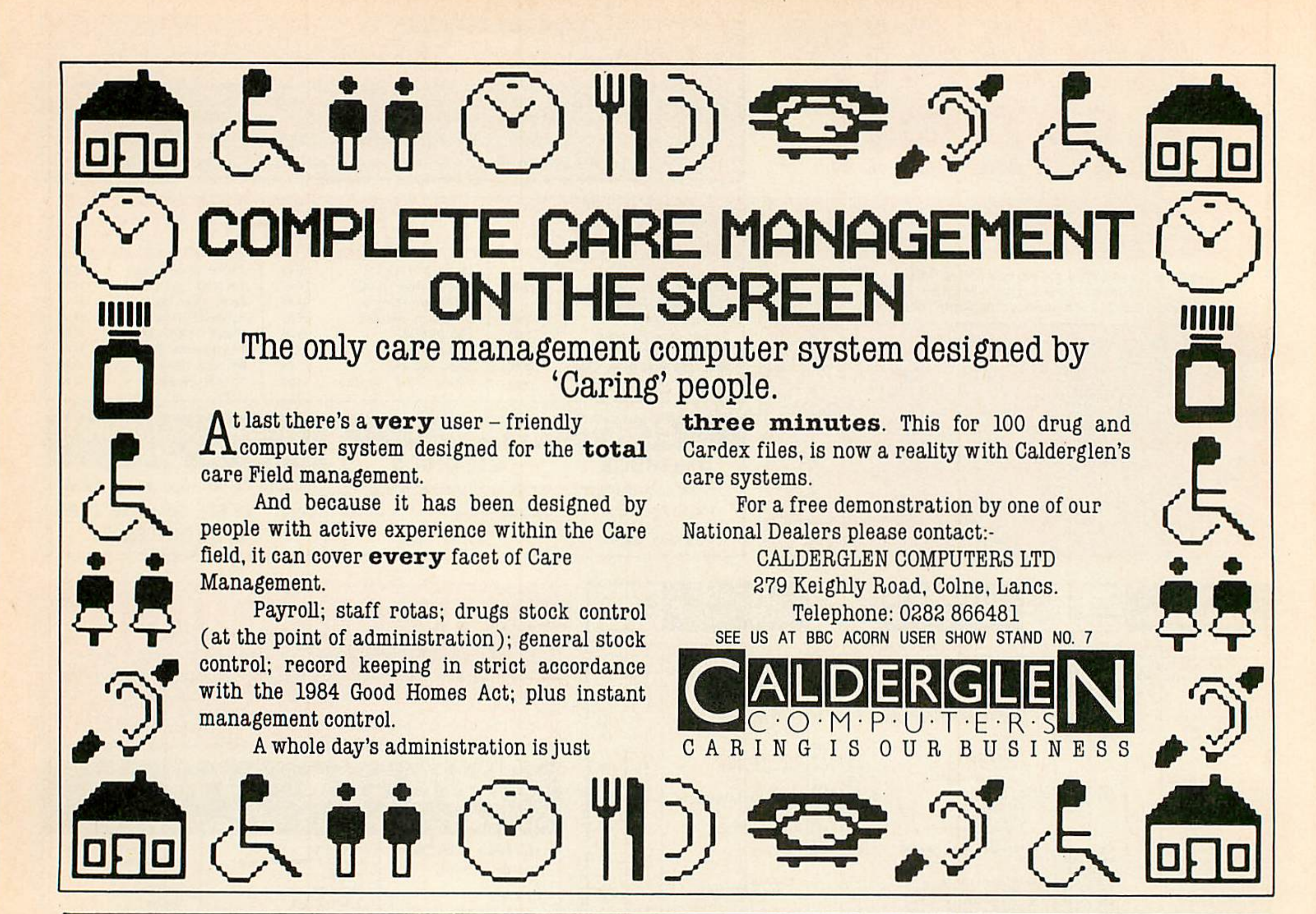
To: Impact Software, Neepsend House, 1 Percy St, Sheffield, S3 8AU
Please send me the following :-

TITLE	FORMAT (Cassette etc.)	COMPUTER	PRICE
....	....	....	....
....	....	....	....
....	....	....	....
....	....	....	....
....	....	....	....
....	....	....	....

(We cannot accept orders for less than £3.00)
* I enclose a cheque/P.O. or : TOTAL COST........ £
* Debit my Access/Visa card account :

(BLOCK CAPITALS PLEASE)
Name........
Address........
....
....
Postcode........

Please send me **FREE** helpsheets/solutions/maps for the following games (from those above)
1........(Orders over £4)
2........(Orders over £10)



Archimedes Shareware Discs

Shareware Nº 0 – Originally called the "Graphics Demo Disc" – 49 graphics demo programs plus "MenuMaster" – a program which allows you to add in your own demos and edit the order in which the programs are run.

Shareware Nº 1 – MenuMaster with 7 more graphics demo programs plus Life, Mandelbrots, European Geography, Structured Directory Lister.

Shareware Nº 2 – DFS reader, backup and archiver, 9 graphics demos, 256 colour Sprite Editor, CMOS ram Editor, Disc Copier, LQ printer Font Definer, Matrix Functions, Memory Mappings & Vector Listings, BASIC Fast Screenload, Connect Four, Mastermind, Solitaire and Star Trek. (Cost £4.50)

Shareware Nº 3 – Epson printer setup, Underground map update, CMOS editor update, System Delta to FWPlus mailshot, Audio tape inlay printer / database, Videotape database, File transfer with a Liberator, Monitor test pattern generator, Contours Demo, Graphics Demo, VTR count-down clock, "ARC" file compressor/decompressor, Flip Game, Night Shooter, Let Drop.

Shareware Nº 4 – BBC font character editor, Bird watcher's database, 3D Mandelbrots (BASIC), Graphical shape transformations, 8 "pretty patterns" programs, Hidden line graph plotting, FWPlus printer driver editor, File transfer and sorting utility, Patience, Golf.

Shareware Disc Nº 5 – 51 pieces of music, some classical, some modern, for the Music Editor.

Shareware Nº 6 – Full of utilities etc for First Word Plus

Shareware Nº 7 – A disc database of Archive magazine plus data files for Archive, Risc User and Beebug for use with the ArcScan Database available from Beebug.

Discs £3.50 each (except Nº2: £4.50) – Buy four discs and get one free

Special price for Archive subscribers – all discs (including Nº2) are only £3.00 each

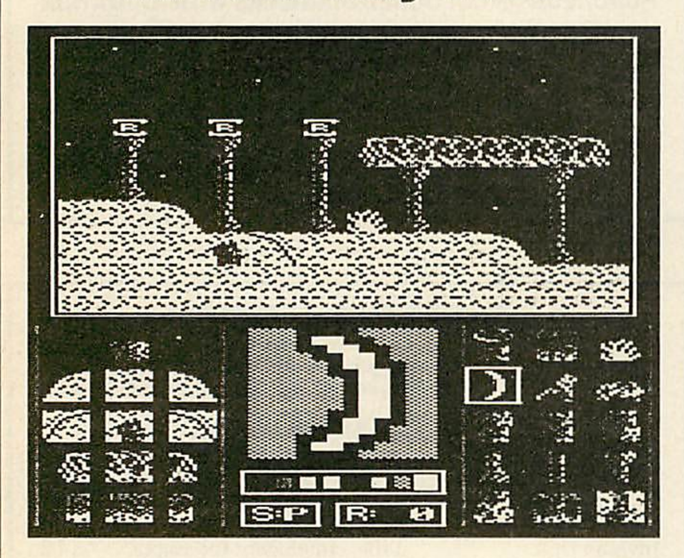
The range of discs available grows steadily. To keep up-to-date with the latest in Shareware and with all things Archimedian, why not subscribe to **Archive Magazine**? Archive is a 56 page magazine costing £14.50 for 12 issues. There is a special back-dated two-year subscription for just £27 including all back issues (while stocks last).

For more details, contact **Bryan Ashton** on 0603–507057. For discs or subscriptions, send cheques, made payable to **Norwich Computer Services, 18 Mile End Road, Norwich, NR4 7QY.**

ACORN USER ADVERTISEMENT PAGES – JULY 1989

NEXT MONTH

Coming to a screen near you on 13th July 1989



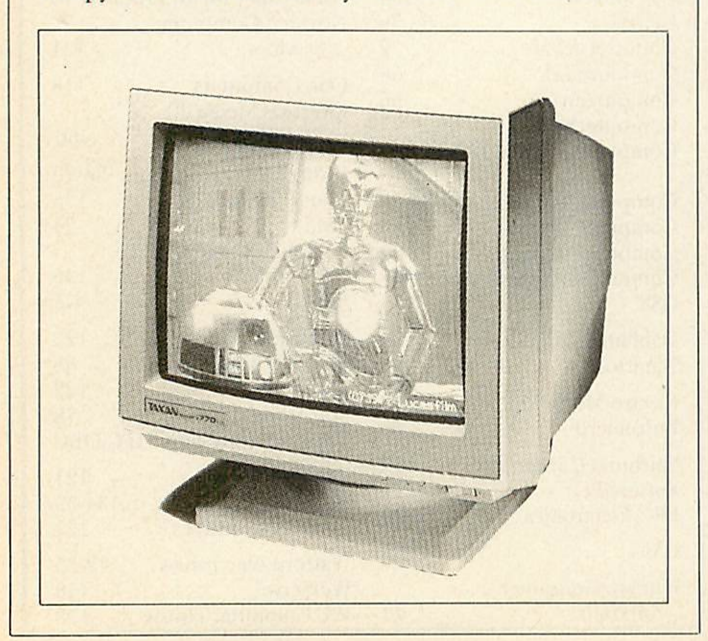
Only *BBC Acorn User* gives you a double dose of Druids. After *Runemaker: Codename Druid*, the best type-in game ever in the April issue, comes . . . Druid Designer.

Hot off the disc drives, in the best traditions of *Repton Infinity* this powerful extension to the game makes it totally customisable and even more fun. It's now better than the best type-in game ever.

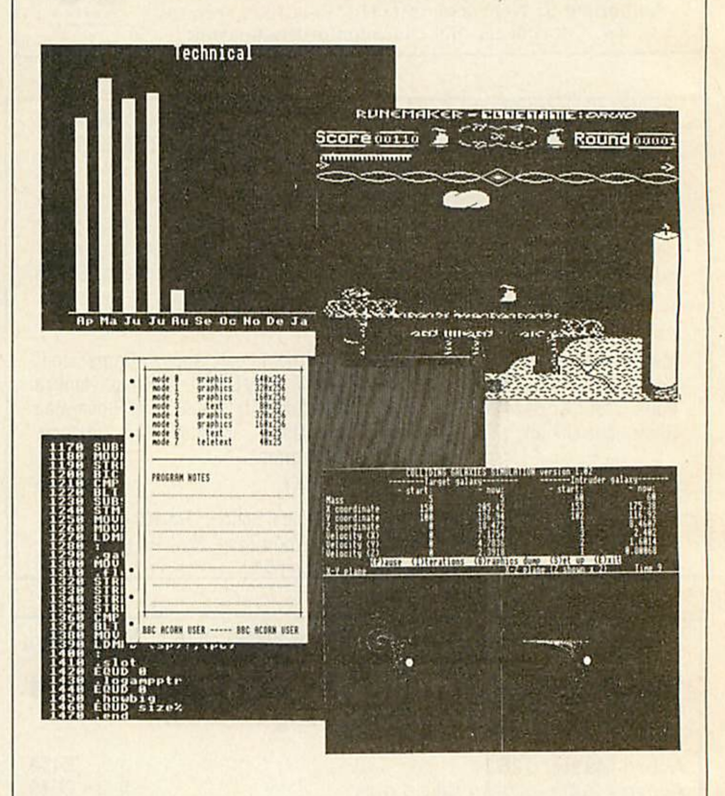
Also in the August issue, the never ending story of interfacing your Archimedes continues with how to add a BBC micro user port podule.

And you can wallpaper your Arc, encode your Beeb and eat your own words with a *Wordwise Plus* menu. Plus, the August issue contains all you ever wanted to know about the *ArcComm* comms package, three family history packages for the Beeb and Arc, *Art Nouveau* and Multisync monitors.

Celebrate the fourth anniversary of Live Aid by buying a copy of *BBC Acorn User* – you know it makes sense.



Can you do better?



As well as articles and programs from the *BBC Acorn User* regular team of experts and know-it-alls, *BAU* also has many features from complete newcomers to publishing, from BBC micro and Arc users who have never dreamt of submitting material to a mag before – from people like you.

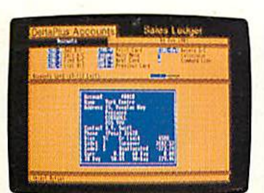
If you have an in-depth knowledge of some aspect of the Beeb, Master or Archimedes, perhaps a way of programming something which nobody has achieved before or simply a great idea, then please don't keep it to yourself, let us all have a look in.

Not only will you achieve fame and world-wide reknown but even a little fortune too.

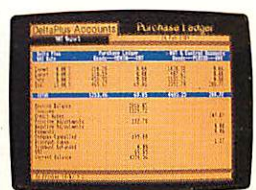
If you want to see your name in print and spread your reputation to the four corners of the known world through the hallowed pages of *BBC Acorn User* then in the first instance send us just a brief description of your idea. If it involves a program then send in a copy of that too, on disc please. Write to:

The Editor
BBC Acorn User
20-26 Brunswick Place
London
N1 6DJ


Jet Fighter
£14.95


Sales Ledger
£64.95


Atelier
£99.95


Purchase Ledger
£64.95

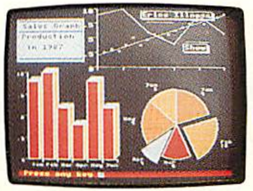

Hoverbod
£14.95


System Delta &
Card Index (BBC) £64.95


Minotaur
£14.95


Home Accounts
£49.95

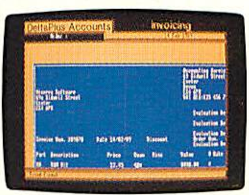

Orion
£14.95

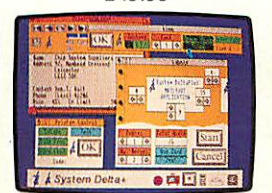

System Gamma (BBC)
£49.95


Reporter
£39.95

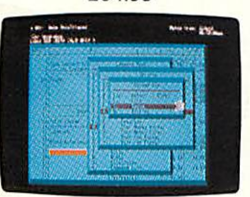

Stock Management
£64.95


Missile Control
£14.95


Order Processing/
Invoicing £64.95


Mailshot
£39.95


Thundermonk
£14.95


SigmaSheet
£69.95


LWT Customisation
p.o.a.


GammaPlot
£69.95

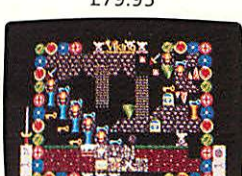

Hotelier (BBC)
£69.95

Nominal Ledger
£64.95

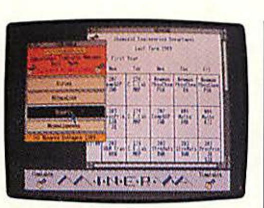
Need we say more?

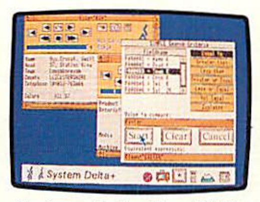

Ancestry
£79.95


Freddy's Folly
£14.95


Ibix, The Viking
£19.95


Stock Management
(BBC) £45.95


Timetabler
£688.85


System Delta Plus (V.2)
£79.95


School Administrator
£149.95


Nominal Ledger (BBC)
£55.95

Archimedes software except where indicated. All prices are inclusive of VAT.





69A SIDWELL STREET, EXETER, EX4 6PH. TEL. (0392)437756
FAX. (0392) 421762

SCHWARZENEGGER

PREDATOR™

Loading Screen

Level 2

Level 3

Level 4

SOMETHING HORRIFYING AND INEXPLICABLE IS GOING TO HAPPEN......

Nothing like it has ever been on Earth before.
It came for the thrill of the hunt.
It picked the wrong person to hunt. YOU!

BBC Micro Cassette	£9.95	Acorn Electron Cassette	£9.95
BBC Micro 5¼" Disc	£11.95	BBC Master Compact 3½" Disc	£14.95

(Compatible with the BBC B, B+ and Master Series computers)

Please make cheques payable to "Superior Software Ltd".

(The screen pictures show the BBC Micro version of the game.)

You've heard about PREDATOR, the Schwarzenegger film – now you can play the leading role. Take a crack commando unit into the South American jungle to rescue a bunch of trapped diplomats. Should be easy enough...so it would be, if it weren't for the mysterious alien who keeps on taking out your men. All the thrills and action have been captured by brilliant programming, using features such as parallax scrolling and dual-screen updating.

Nothing like it has ever been seen before!



ACORNSOFT

(Acornsoft is a registered trademark of Acorn Computers Ltd. Superior Software Ltd is a registered user.)

Dept PR1, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone:(0532) 459453



©1987 Twentieth Century Fox Fim Corp.
Licenced from Activision (UK) Ltd.

Available from



and all major dealers



VISA

24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS

OUR GUARANTEE

- All mail orders are despatched within 24 hours by first-class post.
- Postage and packing is free.
- Faulty cassettes and discs will be replaced immediately.

(This does not affect your statutory rights)